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Construction Methods

McGraw-Hill Publishing Company, Inc.
New York, N. Y.

Road Builders' Issue

Flood Damage to New England Highways
and Bridges

Flood Repair Work on
Arkansas Highways

Tractor-Operated Equipment for
Heavy Grading Job

Sheet Asphalt Floors for
Five-Story Industrial Building

Step-by-Step Methods:
Setting Road Forms

Cantilever Highway Bridge

Hauling What the Shovel Digs

Road Maintenance in Utah

Home-Made Tools for the
Concrete Paving Contractor

Front Cover: Heavy Grading on Approach Roadways
to Carquinez Straits Bridge, California

A MONTHLY PICTORIAL OF FIELD PRACTICE AND EQUIPMENT
General Construction • Highways • Building • Engineering • Industries

R

v. 10

1928

Pacific Avenue, important thoroughfare of Dallas, Texas, is paved with TEXACO Asphalt.



The Viaduct, linking Dallas and Oak Cliff, which carries a continuous stream of traffic, is TEXACO-paved.



Main Street, Dallas, Texas, showing TEXACO Asphalt pavement.

*Note
this
point!*

—and this!

2 OUT OF 3 CITIES
(East of the Rockies)
with population of 25,000 and
over have pavements
of TEXACO

Don't miss the
**ROAD BUILDERS' CONVENTION
and ROAD SHOW**
Cleveland, O., Jan. 9th-13th, 1928

The latest developments in road
construction, maintenance and op-
eration will be discussed.

The most modern types of road
machinery and materials will be
on exhibit.

In constructing pavements
of TEXACO Asphalt,
Dallas, Texas, did not choose
its light traffic, secondary
streets on which to lay them.
This progressive city's heav-
iest traffic is being served
by durable, waterproof
TEXACO.

TEXACO

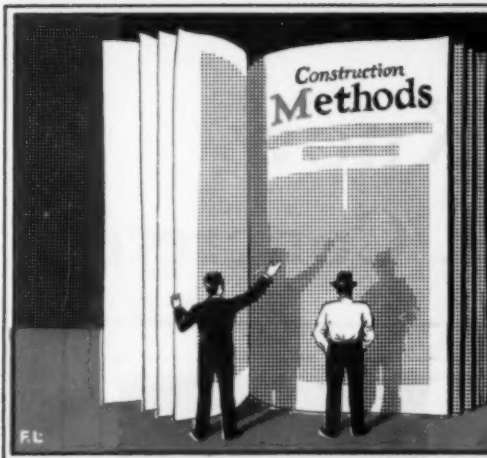
The Texas Company
ASPHALT SALES DEPT.

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Chicago
Cleveland
Kansas City
Houston
Dallas



What's Doing This Month

Looking it over with the Editor

ROAD BUILDERS from every state are heading for Cleveland this month for the annual convention and show of the American Road Builders' Association, Jan. 9-13. With highway topics uppermost right now in the minds of engineers and contractors, *Construction Methods* launches its first number of the New Year as a Road Builders' Issue. It's full of information on grading operations, concrete roads, bituminous construction, brick paving, haulage equipment, highway bridges, maintenance methods, equipment, and tools. Look it over!

We're starting the year by stepping out with new features in this issue—a fresh type dress, pictures that give more details about jobs, several new departments. Tell us how you like them.

CLOSE-UPS: Every real construction man is a crank on details. He's interested, of course, in the general lay-



out of the job, but he likes, also, to study methods and equipment at close range—to develop and apply "kinks" that save time or cut costs. For these men we start with this issue a monthly department, "Getting Down to Details." It's on page 18. You may get an idea there for your own work, or you may have an idea to contribute in the form of a good, close-up photo of one of your job details.

P.S.—There's a ten-dollar bill for the man who submits the best close-up each month.

In his latest annual report Secretary of Commerce Hoover says: "Wages in the United States remain higher than anywhere else in the world, or in any time of the world's history." In the construction industry it's more



than a coincidence that wages start upward when field men begin to pull more levers and lug fewer loads.

JOB GUIDE: If the work where you are located is closing down, or if you are looking for an opening in new territory, you will be interested in the whereabouts of the new jobs opening up. "WHO'S GETTING THE BIG CONTRACTS?" appears for the first time on page 13 of this number.

"Other people," said the New York *World* in welcoming the new Ford car, "may make better music than we make, better rugs, better singers, better ships. But at the business of taking a great machine of steel and men and making it work, we acknowledge no superior, and we believe that is our contribution to civilization." Though inspired by achievement in the automotive industry, this comment applies with full force to construction, where modern methods, machinery and materials are the prime essentials of success.

Construction plant, bought solely on the basis of price, is like the hair of a too chemically vivid blonde. Upkeep and main-



tenance costs are high, and depreciation is staggering. It's wearing qualities that count.

JOB ODDITIES: Here's another feature that makes its bow this month. Did you know that the construction industry has taken a leaf from the book of the sweet girl graduate at Vassar College? See construction's own "Daisy Chain" on page 35.

The Editor is on lookout for snapshots of job oddities. Anything odd on your work?

Hear that doleful sound from the South? It's the mule's swan-song—the "Missouri mocking bird" rendering Tosti's "Good-bye." For southern contractors, rushing to patch the Mississippi levees, are starting to use tractors instead of mules, and soon it will be "taps" for Maud. Read about her passing in the story on pages 26-27. Requiescat in pace!

Recent floods in New England have raised havoc with highways and



bridges. Three pages of pictures this month tell what happened.

There's a man-sized repair job ahead for highway builders in the flood damaged areas of New England and also the Mississippi Valley. How Arkansas is handling it is shown in the series of pictures beginning on page 40.

FRONT COVER: In the April issue we showed how the center span of the Carquinez Straits bridge in California was raised into place. This month's front cover photograph records another step in that project—heavy grading on the roadway approaches with Caterpillar tractors, power shovels and trucks.

NEXT MONTH: Building a sewer with ready-mixed concrete; dismantling a wooden flume with a dragline; special form problems on a large covered concrete reservoir.

Watch for the February issue!

Facts You Should Know about High-Early-Strength Concrete

	High-Early-Strength Concrete is made with the usual labor, usual materials and usual equipment—		and usual Universal cement
—all applied according to fully tested methods.		At 3 days High-Early-Strength Universal Concrete is as strong as ordinary concrete at 28 days.	
	At 28 days it has twice the strength of ordinary concrete.		Having a higher ultimate strength in addition to a higher early strength, it is permanently better and stronger than ordinary concrete. (See diagram)
High-Early-Strength Universal Concrete may be made as workable as desired and used on all types of jobs.	SIDEWALKS ROADS ALLEYS FOUNDATIONS STREETS MACHINERY FOUNDATIONS	For full details send in the accompanying coupon.	

Name _____

Address _____

UNIVERSAL PORTLAND CEMENT CO.
210 South La Salle Street, Chicago
Without obligation, please send me detailed information on methods of securing strong concrete in 3 days with the usual materials and equipment.
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Universal Portland Cement Co.

Chicago Pittsburgh Minneapolis Duluth Cleveland Columbus New York

Concrete for Permanence

Construction Methods

McGraw-Hill
Publishing Company, Inc.
JAMES H. MCGRAW, President
E. J. MEHRN, Vice-President

A Monthly Pictorial of Field Practice and Equipment Illustrating Successful Construction, Maintenance and Material-Handling Methods for General Construction, Highways, Buildings, Industrial Plants and Public Works and Utilities

WILLARD CHEVALIER,
General Manager
ROBERT K. TOMLIN,
Acting Editor

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NUMBER 1

HIGHWAY structures—roadways, bridges and culverts—suffered heavy damage in November from the greatest flood that ever swept over the New England states. In the valleys of the Connecticut and Merrimac Rivers and their tributaries to the north, the

Where
the sweep of the great

New England FLOOD

took toll of the highways
and bridges of

New Hampshire

Photos from F. A. Gardner, assistant engineer, through courtesy of F. E. Everett, commissioner, State Highway Department

Additional Flood Pictures on pages 6 and 7

rising waters took a particularly heavy toll, demolishing at hundreds of places the work of the road builder and the bridge builder.

What happened in one state—New Hampshire—is indicated in the accompanying pictures and those on pages 6 and 7. The

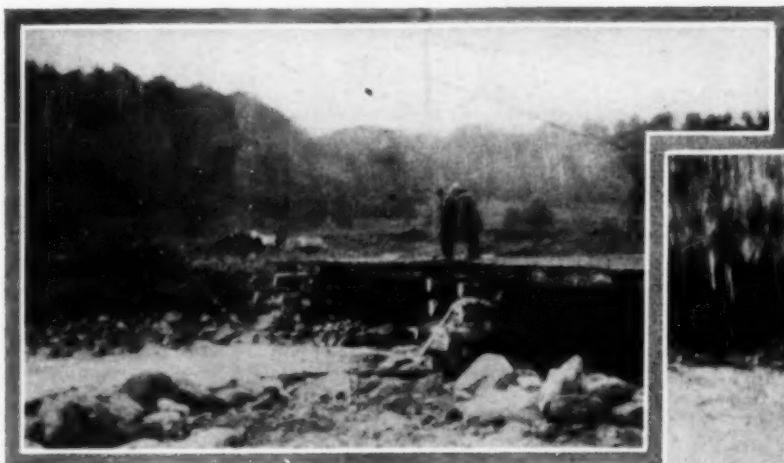
(Continued on page 6)



ABUTMENT WASHOUT wrecked Deep Hole bridge at Crawford Notch.



FLOOD'S TEETH took big bite out of Franconia Notch road.



TEMPORARY CRIBBING replaced highway bridge destroyed at Bath.

FLOOD WATERS swept Peabody River bridge from piers at Gorham.



This Month's "Construction



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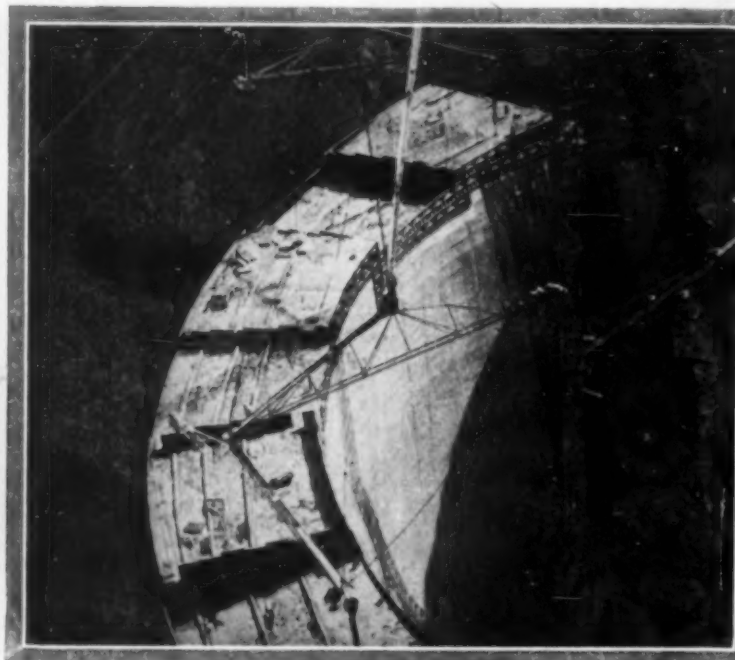
A NEW TOOTH in Chicago's sky-line. Forty-two story Mather Tower, rising 521 ft. above Wacker Drive, completed by W. A. Illsley, general contractor. Earlier progress picture in September issue.

Page Four



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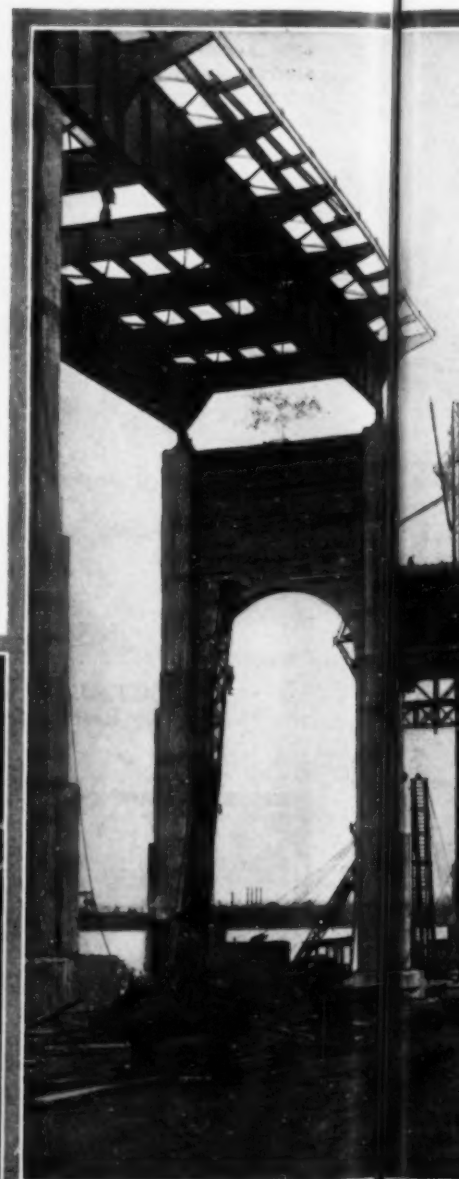
LAUNCHING A NEW IDEA in adapting steel skyscraper construction to the building of small six-room houses at Forest Hills, N. Y. Robert Tappan, architect responsible for the new design, watches Miss Frieda Mierse smash the christening bottle on a column of the first completed steel frame put together in three hours with bolts instead of rivets.



©International

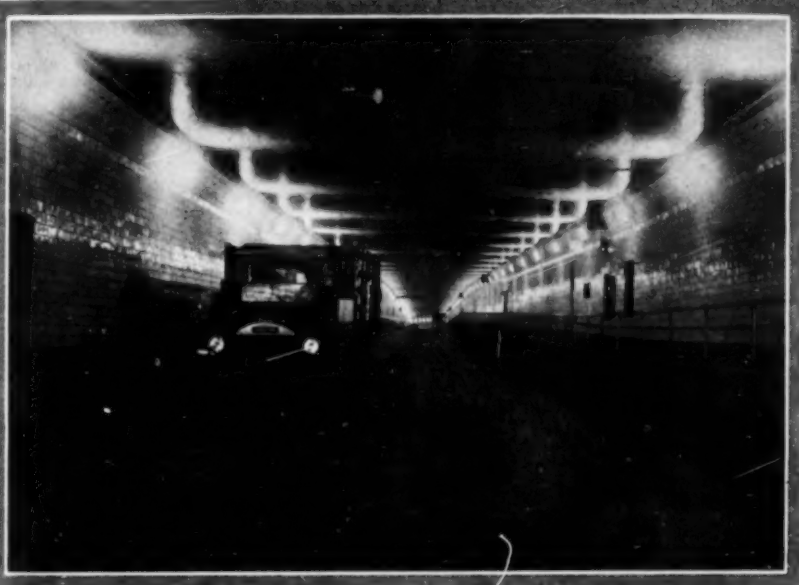
NEARING COMPLETION after two years' work. Pacoima Canyon dam near San Fernando, Calif., 385 ft. high and 600 ft. long. Los Angeles County flood control project. Contractors, Bent Bros., of Los Angeles.

BEGIN TO SET STEEL on approach to one of the two highway toll bridges over the Arthur Kill between Staten Island, N. Y., and New Jersey. Deck plate girders (below), on concrete piers ranging in height up to 130 ft., lead to main cantilever truss spans. The Port of New York Authority is directing the construction.



News Reel"

OPEN TO TRAFFIC! For first time on Nov. 12, the twin-tube Holland Tunnel carried automobiles and motor trucks underneath the Hudson River between New York and Jersey City. Gov. Alfred E. Smith of New York and Gov. Harry Moore of New Jersey (*right*) watch little Ann Egner snip the ribbon that unleashed public traffic. Each tube has a 20-ft. granite paved roadway (*below*). Elaborate lighting and ventilating systems are features of the \$48,000,000 project.



©P & A

©International

SETTING THE STAGE (*below*) for the world's biggest athletic event. Modern methods and equipment help Dutch engineers and contractors speed work on concrete stadium for the 1928 Olympic Games at Amsterdam, Holland.

©P & A



ARMY EQUIPMENT (below), provided emergency river crossing at Burlington, Vt., in form of pontoon bridge.



NORTH WALPOLE, N. H., after the Connecticut River had finished its rampage. (Left.)

*In the Wake
of the*

New England

(Continued from page 3)

path of destruction extended all the way from the Franconia Notch, to the north, down through the state capital at Concord, in the south, where the New Hampshire Highway Commission has its headquarters.

The principal damage to highways consisted in loss of surfacing and em-



FLOOD SCARS on bridge approach at Gorham, N. H.



STATE HIGHWAY GARAGE floors at Concord, N. H., were flooded to a depth of 2 ft.

CLEARING AWAY flood-wrecked bridges on Connecticut River at Bellows Falls, Vt. Locomotive crane helps remove the debris.





SCOUR by the flood waters at Beckett, Mass., demolished concrete highway bridge approaches. (Left.)

© P & A

Flood

bankment by scour or burial under many feet of sand mud and gravel deposited by the flood torrents.

In the neighboring state of Vermont the state highway department, after a careful check, reported the loss of 930 bridges, of which 105 were on federal-aid highways, 203 on state-aid roads and 538 on town roads.

TEMPORARY structure replaces highway bridge washed out at Bethlehem, N. H. (Below.)



CULVERT washout near Hanover, N. H. Temporary log and plank bridge carries traffic. (Above.)



WHERE FLOOD scoured out roadway leading to Williston-Richmond, (Vt.) covered bridge.



TYPICAL CULVERT WASHOUT at Lisbon, N. H. Emergency log bridge in background.

TRACTOR-OPERATED

Speeds Heavy Grading on

BEFORE completing a highway paving job in southern Illinois last summer, the Madison Construction Company obtained a new contract for grading and paving 15 miles of road between Edwardsville and Bunker

Hill, Ill. This meant moving the outfit 200 miles to the new work, which was started Aug. 31.

The contractor decided to use two locations for the material-handling plant serving the new 15-mile contract. On the south end there were several possible locations, but at the north end only one site was available. Bunker Hill, served by the Big Four Railroad, was the only receiving point for concrete materials on this section of the highway.

"Let's finish the north end of the job this fall," said R. B. Dunlap, superintendent for the contractor, "and move the plant to its second location in time for an early start in the spring." Two Johnson bins and batchers served by an Orton crane and grab-bucket accordingly were erected at Bunker Hill, and grading and paving started 6.6 miles south of town, working back toward the plant.

FOR the heavy grading, involving approximately 5,000 cu.yd. of excavation to the mile, J. C. Kelly, Dallas, Tex., subcontractor for this work, used a Stroud elevating grader, pulled by a 10-ton Caterpillar tractor, 20 dump-wagons with three-mule teams and 30 4-ft. Western fresnos.

On the fine grade two 8-ft. Adams blade graders and a Lakewood sub-grader were used with a 5-ton tractor.



THIS TRIO was responsible for putting the job through. (Left to right) Raymond Bailey, inspector; R. B. Dunlap, superintendent, and Arthur Woods, general foreman.



SUBCONTRACTOR J. C. KELLY'S 100 head of mules had to step lively to keep up with the tractor-hauled elevating grader.

EQUIPMENT

Illinois Highway

Contractor uses two locations for material-handling plant on 15-mile concrete paving job

A 5-ft. tumble-bug fresno scraper with a speedy 2-ton tractor made quick work of slicing off the high spots. With a Carr formgrader the foreman had an easy time setting his forms accurately to grade a long distance ahead of the mixer.

The pavement is 18 ft. wide with the standard Illinois 9:7:9-in. cross-section. Fifteen two-batch Hug trucks were used most of the time to serve the 27-cu.ft. Foote mixer, although light one-batch Chevrolet trucks were sometimes employed. The maximum haul was a little less than 8 miles.

A subgrade planer attached to the mixer, as shown in one of the photographs, was one of the most interesting pieces of equipment on the job. By moving the handle up or down, the level of the planer may be adjusted to suit the hardness of the ground. In hard ground the planer must be set higher than in soft ground; otherwise, it will



TUMBLE-BUG fresno with 2-ton tractor prepared subgrade.



FILLING EM UP! At the material-handling plant a crane and grab bucket unloaded the stone to stockpiles or fed the hungry overhead bins. No demurrage charges for the Big Four Railroad when this outfit hits its stride.

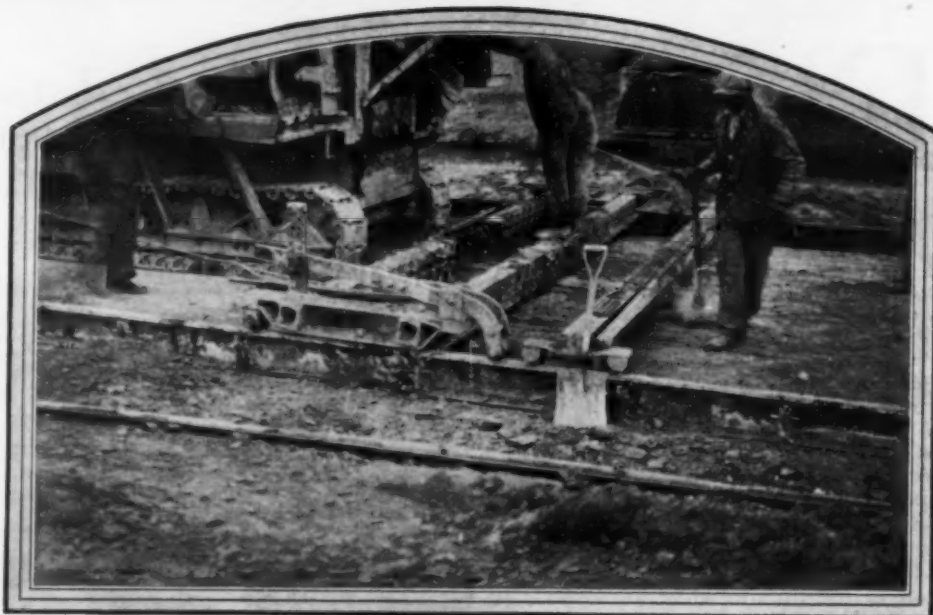


WHAT AN APPETITE that power skip on the 1-yd. paving mixer had! It kept a fleet of two-batch trucks busy pouring the dry mix down its great wide gullet.

scour out the subgrade to too great a depth. The scratch board, fastened by chains behind the planer, is required by specifications. It clears the specified subgrade by $\frac{1}{4}$ in.

THE concrete was finished by an Ord surfacing machine, a 15-ft. float equipped with plow handles, and a Lakewood belter. Two men on bridges handled the long float, starting at the center line and working off the surface water to the edge of the road. Calcium chloride was used for curing.

R. B. Dunlap was superintendent for the Madison Construction Company, Edwardsville, Ill. He was assisted by Arthur Woods, general foreman. The resident engineer, in charge for the Illinois Division of Highways, was P. M. Perkins.



ADJUSTABLE! By moving handle up or down, this job-made subgrade planer may be set to work at proper depth.



PUTTING ON THE FINISHING TOUCHES with a mechanical surfacer and a 15-ft. float equipped with plow handles.

FOR CURING the finished surface the contractor applied calcium chloride from a two-wheeled distributing cart.



STREET PAVING GANG and equipment were later transferred to floor surfacing job in industrial building.

Pave Building Floors *Like Streets with* Sheet Asphalt

FOR surfacing with sheet asphalt the floors and basement of the new five-story shipping building of the Kohler Company, of Kohler, Wis., J. Rasmussen & Sons Company, contractor, of Oshkosh, Wis., used the same methods, equipment and construction crew as were employed on paving village streets. The shipping building is 300 ft. long and 100 ft. wide and required for its floor surfacing a total of 20,000 sq.yd. of sheet asphalt.

An asphalt plant prepared a Texaco



HOT STUFF is being dumped from light trucks for spreading and raking. Three-wheel roller stands by to compact surface. Rope joint in foreground.



SPREADING AND RAKING mixture for initial compression by light 3½-ton three-wheel roller. Heavier tandem roller in foreground finishes up the job.

mixture in the usual way, except that rather hard asphaltic cement was used, and the toughness of the mixture was further increased by incorporating in every batch a certain amount of Celite. The same dump trucks used in outside street construction conveyed the hot mixture from the plant to the floors where it was spread, raked and rolled, as shown in the accompanying photograph. Because of its toughness the mixture had to be rolled as quickly

Next Month . . .

Contractors usually operate their own concrete-mixing plants. Some recent jobs, however, have been supplied with

Ready-Mixed Concrete

Next month's issue will tell how concrete for a large sewer in St. Louis was handled in this way.

as possible after raking to obtain the proper consolidation. The roller operator had to develop a special technique in weaving in and out around columns, except on the top floor.

For the Kohler Company and the village of the same name, the Jerry Donohue Engineering Company of Sheboygan, Wis., handled all engineering work. The Chicago Paving Laboratory developed the special mixture and supervised the laying of the asphalt floors in the shipping building.



HOW THE ASPHALT-SURFACED floor looks. Dodging columns on lower floors presented to the roller operators a problem not encountered in laying sheet asphalt for streets.

Who's Getting the BIG CONTRACTS?

A Monthly Guide to Where the Construction Dollar is Being Spent

Pacific Coast

Washington
Highways:
Hendricks & Olson, Chehalis,
Wash., \$106,418
Echo Dam, Utah
Earthwork: \$1,125,000
A. Guthrie & Co., Sherlock
Bldg., Portland, Ore.
Pasadena, Calif.
Bank and Office: \$1,000,000
J. V. McNeill Co., 5860 Aven-
ue Blvd., Los Angeles
Burbank, Calif.
Studio: \$1,000,000
J. H. Woodworth & Sons, 200
E. Colorado St., Pasadena
Los Angeles, Calif.
Hospital: \$450,000
W. D. Lee, 704 Textile Center
Bldg.
Sewer: \$237,682
Frederickson & Watson, 354
Hobart St., Oakland, Calif.
San Diego, Calif.
Paving: \$264,465
United Concrete Pipe &
Constr. Co., 675 Chamber of
Commerce Bldg., Los Angeles
San Francisco, Calif.
Mercantile: \$700,000
Macdonald & Kahn, Financial
Center Bldg.
Los Angeles, Calif.
Grading and paving: \$513,975
Fleming Constr. Co., 105 N.
Park Ave., Pomona, Calif.
Curtis Paving Co., 2440 E.
26th St., Los Angeles
Oregon and Idaho
Railroad: 24 mi., \$345,312
General Constr. Co., Seattle,
Wash.
Santa Monica, Calif.
Paving: \$211,390
Kneen Paving Co., Dudley
Block

West of Mississippi

St. Louis, Mo.
Candy factory: \$1,000,000
Gamble Constr. Co., 620
Chestnut St.
Iowa
Highways:
Union Constr. Co., \$1,178,254
New York St., Des Moines
A. F. Johnson Constr. Co.,
\$656,970, Minneapolis, Minn.
Harrison Eng. & Constr. Co.,
\$537,347, Mutual Bldg., Kan-
sas City, Mo.
Montana and North Dakota
Water Softening Plants:
\$300,000
E. J. Dunigan, 1012 Builders'
Exchange Bldg., St. Paul,
Minn.
San Antonio, Tex.
Power plants: \$2,000,000
Sumner Sollitt Co., Nat'l
Bank of Commerce Bldg.
Minnesota
Highways: \$792,884
C. F. Sculley Equipment Co.,
212 Dakota Bldg., St. Paul
Arkansas
Highways: \$652,956
W. J. Runyon Paving Co.,
Sheffield, Ark.
Oklahoma
Highways:
Ward-Beekman & Brooks,
\$84,667, 1801 E. 9th St., Okla-
homa City
Marshalltown, Ia.
Hotel: \$500,000
H. L. Stevens & Co., 30 North
Michigan Ave., Chicago, Ill.
Tulsa, Okla.
Office: \$470,000
Shallenberger Constr. Co.,
1631 E. 6th St.
Texas, New Mexico and Colorado
Gas pipe line: \$16,000,000
Ford, Bacon & Davis, Inc.,
115 Broadway, N. Y. C.
Pipe laying relet to:
Oklahoma Contg. Co., Dallas,
Texas
Williams Bros. Inc., Midco
Bldg., Tulsa, Okla.

The MAN and the JOB

ON THIS PAGE Construction Methods presents a new fea-
ture intended to give the field men of construction and in-
dustry a picture of the high-spot jobs for which important
contracts have recently been let and their distribution by
territories.

If the work where you are located is closing down, if you
are looking for an opening with a contractor in new territory,
the information on this page may be of help to you in in-
dicating where construction is active.

The contracts listed herewith are, of course, only a few of
the total number recently let. You may wish to ask about
others. If so, address your inquiries to:

The Editor, Construction Methods,
Tenth Ave. at 36th St., New York

Middle West

Chicago, Ill.
Sewers: \$1,864,720
Underground Constr. Co., 130
North Wells St.
Aquarium: \$3,000,000
R. C. Wieboldt Co., 1534
West Van Buren St.
Coke ovens, etc.: \$3,000,000
H. Koppers Co., Union Trust
Bldg., Pittsburgh, Pa.
Apartment: \$2,000,000
Reliance Co., 11 South La
Salle St.
Soap factory: \$1,000,000
Avery Brundage, 110 South
Dearborn St.

Akron, Ohio
Country club: \$500,000
American Park Builders, 201
E. Ontario St., Chicago
Detroit, Mich.
Motor factory: 4 stories, 60 x
40 ft.
W. E. Wood Co., 1806 Ford
Bldg.
Missouri
Railroad: \$3,000,000
Work by day labor
Cleveland, Ohio
Bridge: \$250,000
D. Lowensohn Constr. Co.
8810 Woodland Ave.



New England

Boston, Mass.
Station and Colosseum,
\$4,000,000
Dwight P. Robinson & Co.,
125 E. 46 St., N. Y. C.
Brockton, Mass.
Highways: \$228,616
Powers Bros., Montello St.,
Brockton
Bridgeport, Conn.
Airport: \$300,000
W. E. Arthur & Co., 292 Mad-
ison Ave., N. Y. C.
Danbury, Conn.
Theatre: \$300,000
T. J. Parry Constr. Co., 1481
Seaview Ave., Bridgeport
Weymouth, Mass.
High School: \$300,000
J. Miles & Son, 393 Main St.,
Worcester, Mass.
Everett, Mass.
Sub-station: \$500,000
Coleman Bros. Co., 245 State
St., Boston
Providence, R. I.
High School: \$810,517
E. Turgeon, 36 Exchange
Place
Rutland, Vt.
High School: \$300,000
C. T. Rockefeller, 16 Norwich
St., Worcester, Mass.

Middle Atlantic

New York City
Office: \$6,500,000
Hospital: \$1,250,000
Marc Eldilts & Sons, 41 E.
42nd St.
Subway: \$4,722,885
Marcus Contg. Co., 305
Broadway
Subway: \$5,735,149
Moranti & Raymond, 42
Broadway
Office: \$3,000,000
Starrett Bros., 101 Park Ave.
Car Shops: \$4,170,000
Eastern Construction Co., 110
W. 40th St.
Hospital: \$2,000,000
Geo. A. Fuller Co., 949
Broadway
Syracuse, N. Y.
Office: \$2,500,000
G. Richard Davis, 10 E. 41
St., N. Y. C.
Brooklyn, N. Y.
College: \$1,000,000
T. O'Reilly, 415 Lexington
Ave., N. Y. C.
Newark, N. J.
Arena: \$1,000,000
E. M. Waldron, Inc., 27 Central
Ave.
East Orange, N. J.
Apartment: \$1,000,000
Corona Constr. Co., Military
Park Bldg., Newark
Hoboken, N. J.
Theatre: \$1,000,000
Belmont Iron Works, 44
Whitehall St., N. Y. C.
Ocean City, N. J.
Bridge: \$1,000,000
Frederick Snare Corp., 114
Liberty St., N. Y. C.
New York and New Jersey
Bridges:
Cornell Contg. Co., \$626,730
Grand Central Terminal,
N. Y. C.
A. A. Volk Co., \$478,650
1819 Broadway, N. Y. C.
Duquesne, Pa.
Bridge: \$900,000
Pitt. Constr. Co., Empire
Bldg., Pittsburgh
Baltimore, Md.
Medical Library: \$400,000
Consolidated Eng. Co., 20 E.
Franklin St.
Washington, D. C.
High School: \$495,000
G. E. Wyne, 13th St. & Dog-
wood Ave., N. W.
Pennsylvania
Highways: \$1,272,458
Hagedorn Constr. Co., \$286,-
036, Grafton, W. Va.

South

Yorktown, Va.
Bridge: \$1,250,000-\$1,500,000
Winston Bros. Co. and H. H.
Wilson, Harrisburg, Pa.
Happy Valley, Tenn.
Factory: \$37,500,000
McClintic-Marshall Co., 50
Church St., N. Y. C.
Hughes-Foulkrod Co., Com-
monwealth Bldg., Phila., Pa.
Tampa, Fla.
Power plant: \$5,000,000
Stone & Webster, Inc., 147
Milk St., Boston, Mass.
Louisiana
Highways:
J. W. McKeithen, Grayson,
\$135,955
J. P. Herbert, Breaux Bridge,
\$111,489
Trussville, Ala.
Paving: \$100,000
J. Gwin, Comer Bldg.,
Birmingham
Jackson, Miss.
Hospital: \$447,800
I. C. Garber, Medical Bldg.
Mobile, Ala.
Foundation for plant: \$230,667
Doulet & Ewin, Q. & C. Bldg.,
New Orleans
Jackson, Miss.
Paving: \$410,192
Lawrence Constr. Co., Jackson
Knoxville, Tenn.
Theatre: \$600,000
George A. Fuller Co., 949
Broadway, New York, N. Y.
Moss Point, Miss.
Boiler house: \$250,000
Combustion Eng. Co., 200
Madison Ave., N. Y. C.

Illinois
Highways:
W. A. Black Co., \$395,799,
565 West Washington Blvd.,
Chicago
Harrison Eng. & Constr. Co.,
\$277,491, Mutual Bldg., Kan-
sas City, Mo.
Cleveland, O.
Theatre: \$750,000
Julius Miller Co., 10819 Drexel
Ave.
Toledo, O.
Theatre: \$1,500,000
Lundoff-Bicknell Co., B. F.
Keith Bldg., Cleveland
Dayton, O.
Sewage Disposal plant: \$677,928
E. E. Latham, 447 Neilston,
Columbus
Rockford, Ill.
Hotel: \$1,000,000
Ericsson & Benson, 123 W.
Madison St., Chicago
Waukegan, Ill.
Nurses home: \$1,000,000
H. Schmidt & Son, 14-16 Bur-
leigh St., Milwaukee, Wis.
Detroit, Mich.
Office building: \$8,000,000
W. E. Wood Co., 1805 Ford
Bldg.
Pontiac, Mich.
Auto factory: \$2,000,000
W. E. Wood Co. (founda-
tion), 1805 Ford Bldg., Detroit
Otto Misch Co. (superstruc-
ture), 159 E. Columbia St.,
Detroit
Detroit, Mich.
Club House: \$2,000,000
C. S. Barry Co., 2631 Wood-
ward Ave.

1 STEEL PINS are driven on the form line and a string stretched to line and grade. Firm subgrade has been prepared to proper elevation, 9 in. below the top of the pavement. Subgrade has been rolled for 2 ft. outside pavement edge.



2 FIRST 10-FT. LENGTH of form is placed and held to line and grade by two stakes, one at each end. Then the next length of form is brought up to butt against the end of the first form. Form setter begins to drive the lock-joint plate to connect the two forms.

Step-by-Step **FIELD METHODS**



3 LOCK PLATE is driven completely home, thus establishing a rigid connection between the two forms. One end of the second form is thus automatically brought to exact line and grade to produce smooth, true joint.



4 FORM SETTER now proceeds to the free end of the second length of form and drives the $\frac{7}{8}$ -in. round steel stake in the stake pocket. The sledge is used for driving stakes only.



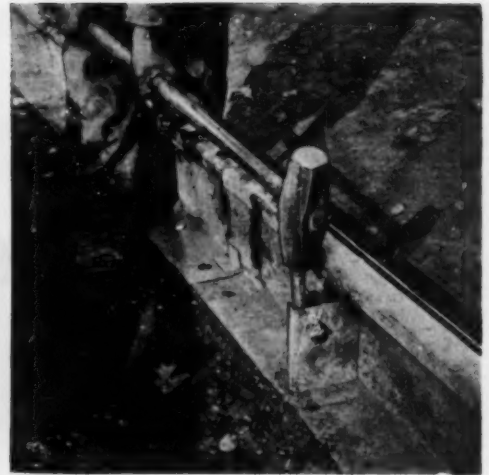
5 AFTER THE STAKE is driven the form setter holds the free end of the form to line and grade with one hand and proceeds to drive the wedge so as to key the form to the stake.



6 THE $\frac{1}{4}$ -IN. STEEL PLATE WEDGE has been driven, firmly keying the form to line and grade.



7 SECOND LENGTH of form is held accurately to proper line and grade by the lock-joint connection at one end and the stake and key at the other end.



8 THEN THE STAKE is driven in the stake pocket adjacent to the lock joint.

How to Set Road Forms

Accuracy Means Attention to Details

ON ANY concrete paving job, one of the important operations is the setting of the road forms. Whether the costs are high or low or the quality of the finished slab good or bad, depends, not on luck, but on a painstaking attention to details.

The series of pictures on this and the opposite page was specially taken to illustrate, step by step, approved methods

of setting Blaw-Knox steel road forms on a concrete highway being built by Harry M. Bates, contractor, at Steubenville, Ohio. The forms are completing their second year of service.

A great aid to the accuracy of the road-form work is given by having line and grade stakes on both sides of the road not more than 25 ft. apart—closer on vertical and horizontal curves.



9 AND THE STEEL PLATE WEDGE is driven home, securing the form to steel stakes at both ends.

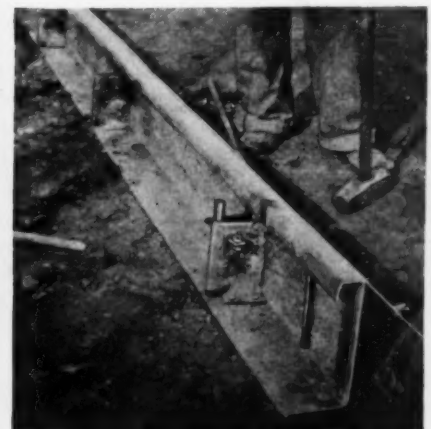


10 THE FORM has been firmly and accurately set to line and grade. This process is then repeated indefinitely. The stake in the center stake pocket is driven and keyed up any time prior to the arrival of the paving mixer and finishing machine. Usually the form setter's helper attends to this.

Next Month!

This series will be concluded with a picture story on

"How to Strip Road Forms"



11 SETUP of road forms completed.

SKIMMER SCOOP excavates subgrade to receive 6-in. shell base compacted and topped with 1-in. sand cushion to carry thin vitrified brick with asphalt joint filler.



How

FLORIDA CITY *Paves* *with Vitrified Brick*



VETERAN of 25 years' service with contractor, former slave and now boss of bricklaying crew, this 85-year-old worker, Hill, keeps laborers hustling.

SAYS Y. BRIDDELL, superintendent for the Georgia Engineering Company of Augusta: "We have laid some 200 miles of 3-in. vitrified brick pavement in St. Petersburg, Fla. About 80 per

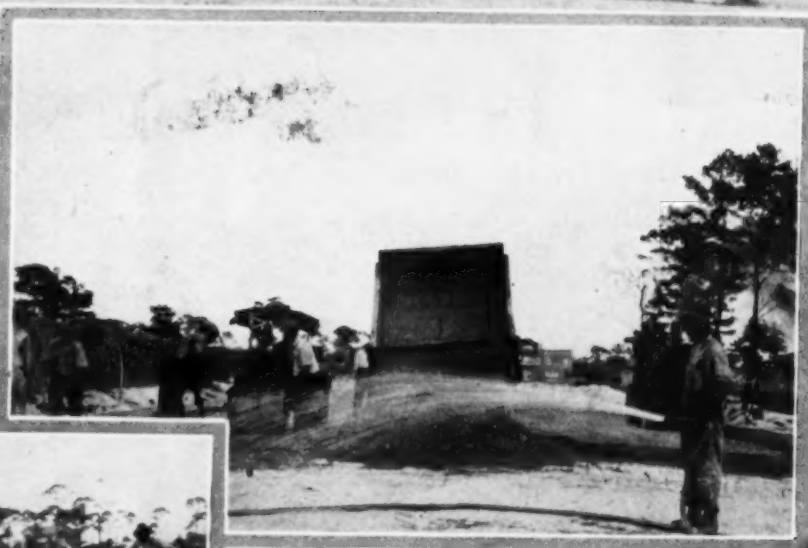
cent of it is on native sand with sand filler. The remaining 20 per cent is on 1-in. sand cushion over a shell base compacted with 5 and 7-ton rollers. Either a sand or an asphalt joint filler is used."

PUTTING DOWN THE SHELL BASE in two layers. Three-ton and five-ton rollers compact lower course to 4 in.; five-ton and seven-ton rollers compact top course to 2 in. Charlie Larry, at extreme right, is champion bricklayer in spite of loss of both legs in railroad accident.





JUST ONE ROW AFTER ANOTHER! Here's the way they put down the thin vitrified brick on the 1-in. sand cushion.



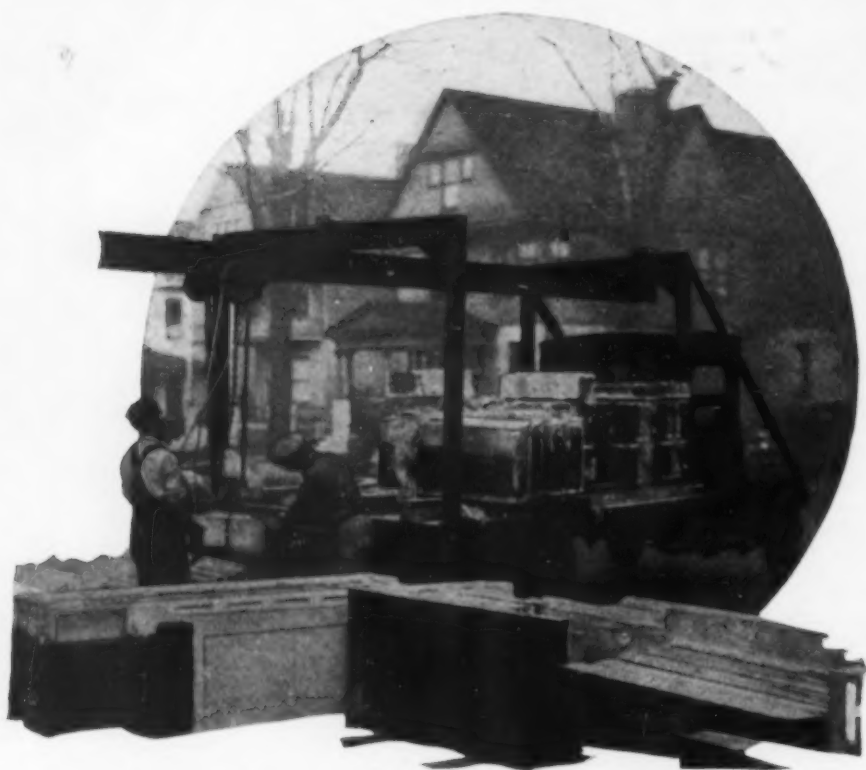
WETTING DOWN SUBGRADE before shell base is spread



GRANITE SLABS, 4 in. wide and 14 to 18 in. deep, form the curb for the completed pavement.

A LESSON IN CONSERVATION! Central Ave. widened to 60 ft. and repaved with same brick used on the pair of 18-ft. strips originally surfaced 13 years ago.





THIS TRUCK LOADS ITSELF. In handling heavy building stone on Springfield, Ill., cathedral, Math. Rauert, Chicago contractor, used truck with cantilever I-beam and chain hoist to load and unload the stone.

Getting Down to Details

A New Feature

ON THIS page *Construction Methods* presents a new feature: a department of job "close-ups" for the field men of construction and industry.

Its object?

To picture at close range practical applications of equipment and materials for doing more and better work in fewer hours at less cost.

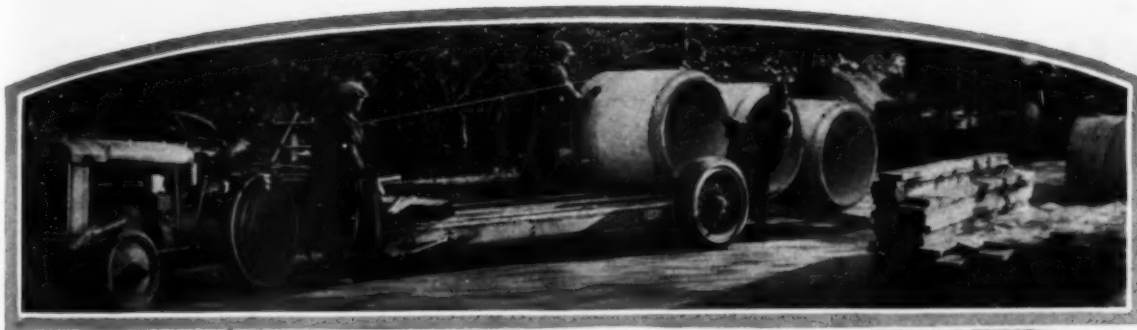
Next month: More detail photos. What's new on your job? See suggestion on next page.



RIP! CRACK! CATERPILLAR TRACTOR YANKS out sidewalk slabs for street widening in Minneapolis.

STEAM SHOVEL HITS in the pinches. With no other equipment available, contractor sets heavy culvert pipe with "Old Trusty."





SPECIAL BLADE ON TRACTOR-OPERATED grader shapes subgrade for thickened edge concrete paving slab in Indiana

EASY THERE! TRAILER with hand winch and cable unloads 42-in. pipe on sewer job in Indianapolis. The Independent Concrete Pipe Company supplied the pipe for Krenn & Dato Building & Construction Company, Chicago, the contractor.

"CLOSE-UPS" from Your Job

ON YOUR work you must have a lot of interesting details of the kind illustrated on these pages. Look through your photo files or get out your camera and take a good *close-up* shot of some construction kink that you have found helpful.

Send pictures of your job "close-ups" to the Editor of *Construction Methods*, Tenth Avenue at Thirty-Sixth Street, New York.

For the best detail picture received during each month \$10 will be paid. All others acceptable for publication will be paid for at regular rates.



THE MOVING FINGER OILS. Contractor uses novel hose and pipe attachment for surface-treating gravel road in Portchester, N. Y.



"THEY SAVED ME MONEY," says John Frantz, Sidney, Ohio, contractor, of the three Miami scrapers on the loading platform, which he used on a street grading job in Sidney. "I found them particularly economical in loading trucks from a platform," he continues. "We built a platform with two openings for the trucks to run under, and in 20 hours moved 424 yd. of earth."

Crossing THE COLUMBIA

*Building steel
highway bridge
at Vantage Ferry
Washington*



DOWN GOES THE CAISSON!
For setting river piers 60 ft. below
water level. (Above.)

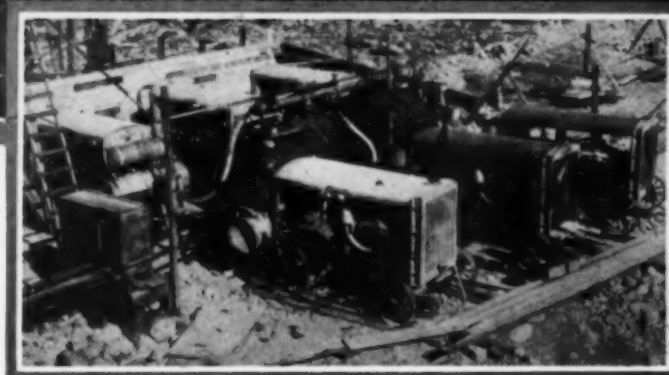
IN BUILDING a steel highway bridge, which rises 90 ft. above the Columbia River at Vantage Ferry, Wash., the contractors, Kuckenberg & Wittman, of Portland, Ore., adopted some new methods on their work. They installed a battery of six portable compressors instead of a single stationary unit, and evolved some new ways of handling concreting on the bridge approach.

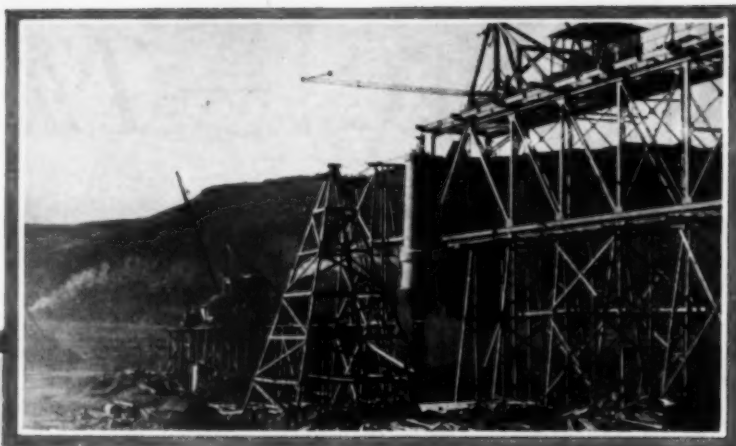
The bridge, a cantilever structure carried on two river piers sunk to bed-rock, was finished this summer. Derricks swung the steel into place, and when the final girders met at the center of the 520-ft. span, they were only $\frac{1}{4}$ in. out of line. Credit for this achievement



DERRICKS SWING AND ENGINES PUFF
as work goes out from both sides. Cableway
crosses river.

THE COMPRESSOR PLANT.
A battery of six Sullivan portable
units supplied the air.





PUSHING THE STEEL OUT
with derrick and traveler.



ON ITS WAY ACROSS THE COLUMBIA RIVER.
Approach structure with first steel span in place
at Vantage Ferry, Wash.

goes to the resident engineer on the job, George H. Shearer.

The caisson and steel contractors, Booth & Pomeroy, of Portland, used open caissons in building the river piers, driving them down 30 ft. through gravel and sand by open dredging, and the rest of the way down to bedrock under compressed air. The crew averaged an inch an hour in sinking the caissons. Six Sullivan portable gasoline compressors, each with a capacity of 330 cu.ft. per minute, supplied air to the caissons. Superintendent Andrew Wittman used this equipment instead of a single unit because of its greater flexibility.

IN CONCRETING the approaches and floor slab of the bridge, unusual precautions had to be taken, due to high temperatures, averaging 100 deg. Describing the concreting, H. G.

Mills, resident engineer succeeding Mr. Shearer, says: "To prevent the usual cracks which appear at panel points, we used thin Elastite paper at every third panel and at every construction joint in the slab. We took great care in curing, and I feel lucky that such a small number of hair cracks have shown up."

Of the slab construction Mr. Mills says: "We rodded the slab transversely off bulkheads on the floorbeams, set to proper depth and crown section. We hit trouble when trying to withdraw these 2-in. bulkheads from the concrete, and so started to use double bulkheads, separated by wedge shaped blocks which

kept the bulkheads apart. In withdrawing, workmen knocked these blocks out, and it was then easy to take out the bulkheads. They filled the bulkhead spaces with concrete."

The floor slab was concreted with two dump cars running on track supported by stringers on the bridge hand rails, bringing the concrete from the mixing plant near the bridge approaches.

TO FACILITATE handling of material and communication across the Columbia River, the contractors built a cableway, shown in one of the photographs on the opposite page.

Here They Are!—*This*

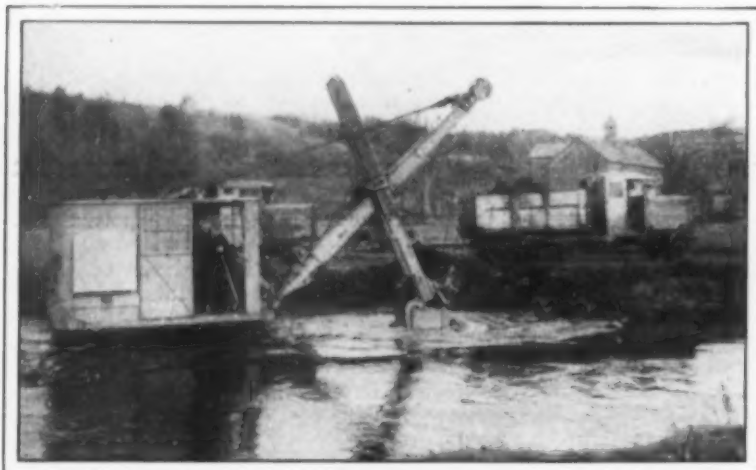
FIRST Prize \$25⁰⁰

Won by CHARLES T. FISHER

Engineer for Owen P. Williams, General Contractor, of Oneonta, N. Y.



"BY LAND OR BY SEA!"—It's all the same to this Paul Revere of construction—a crawler-mounted truck which goes right out into the water and gets its load. The power shovel, also ocean going, scoops gravel from the creek bed for use on a highway job in New York. In this way the contractor cut down his haul materially which makes this picture not only striking and unusual but *practical*.



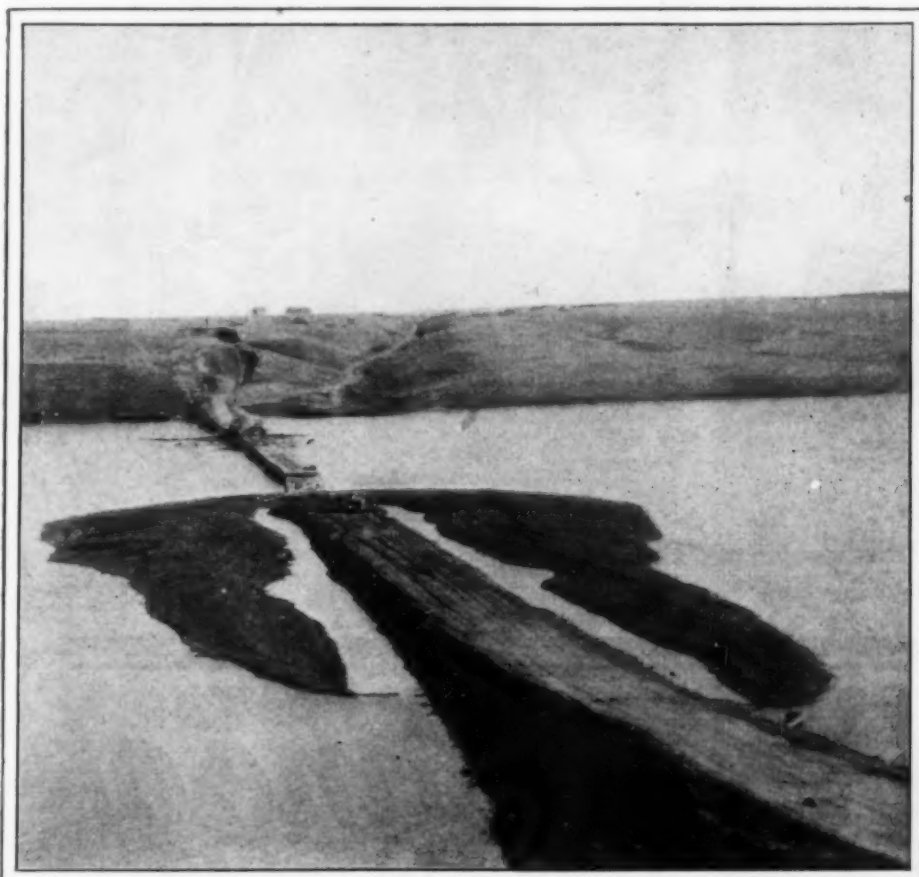
"COME ON IN. THE WATER'S FINE!" The shovel goes for a little swim on its own account. It's digging from a borrow pit in the bed of Ouleout Creek, gouging out gravel for the Franklin-North Franklin highway, Delaware County, N. Y. The truck, having had its bath, dries out at the right.

is Month's Prize-Winning Pictures

SECOND Prize \$15⁰⁰

Won by A. S. MAREAN

Resident Engineer, North Dakota State Highway Commission, Bowbells, N. D.



SQUASH!—Lake bottom comes up as contractors lay highway fill. Photo shows muck rising out of the water in Upper Des Lacs Lake, near Bowbells, N. D., when fill of 158,000 cu.yd. was made. The fill replaced an old highway trestle.

How About YOUR Job?

Let's See It

DON'T let the other fellow do all the work, and—pull down all the prize money. There *must* be some novel or unusual feature about your job, too. So get the dust off that camera!

We want novel—useful—attractive pictures; pictures that catch the eye; tell how you're doing the job; show applications of equipment and

methods. Artistic quality, though considered, is secondary as a basis for prize awards.

CONDITIONS. The only conditions are: Pictures must be taken by a man actually employed on the job, and should be sent to *Construction Methods*, Tenth Avenue at Thirty-sixth Street, New York City, by Jan. 10, plainly marked "Photographic Contest." Photographs received after that date will be entered in the March contest. *Construction Methods* will pay for all non-prize-winning pictures it uses.

Prizes Every Month

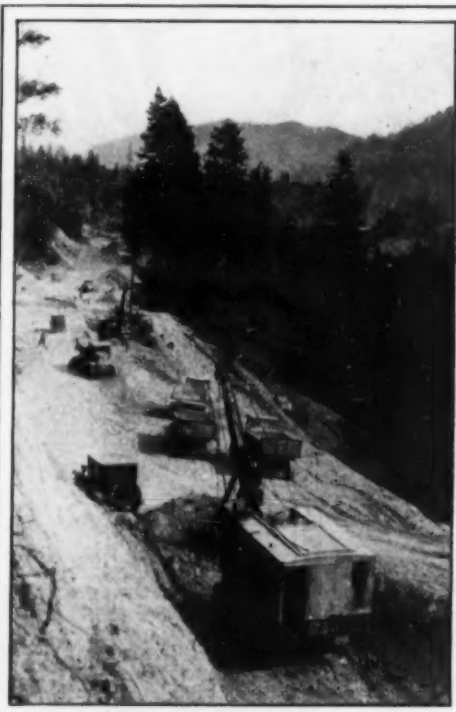
Every month *Construction Methods* awards three prizes, of \$25, \$15 and \$10, for the most novel, useful, and attractive pictures taken by construction men on construction jobs. This month, with the Road Show and Convention being held in Cleveland, Jan. 9-13, the entries were limited to highway pictures.

Next month the contest is free for all

THIRD Prize \$10⁰⁰

Won by K. H. TATLOW, 3rd

Junior Highway Engineer, U. S. Bureau of Public Roads, Redlands, Calif.



TRAFFIC MUST GO ON! Steam shovels and autos chug side by side when A. Haidlen Co., contractor, keeps heavy grading job open despite difficulties. Shovel in foreground is digging out old roadway, relocating line for new Pacific Coast Highway, near La Moine, Cal.

The *BYERS* Bear Cat



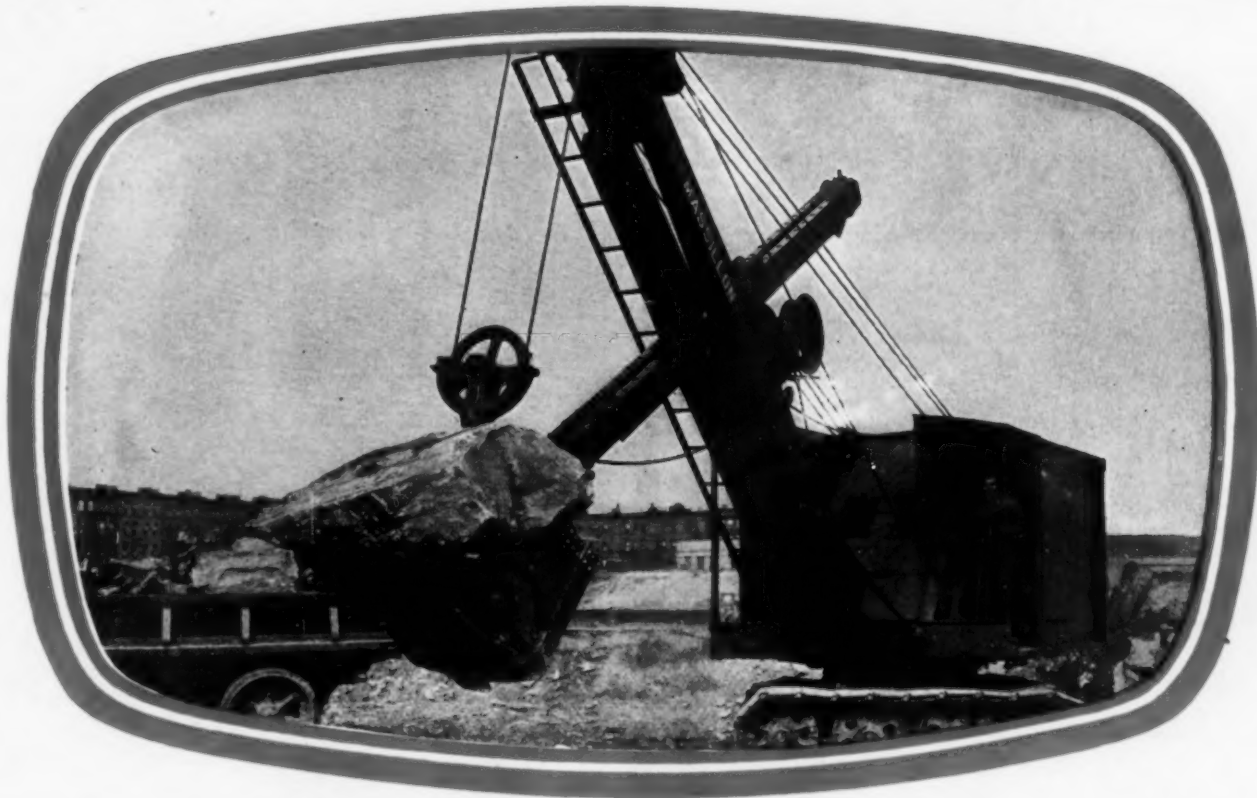
The Greatest Line of
1½-5/8 Yard *in the*



The Bear Cat is noted for its speed, economy, and all-around usefulness. Handling five interchangeable attachments, it is equally successful as a crane, shovel, skimmer, ditcher and backfiller. Big full crawler mounting affords 100 per cent traction. The Bear Cat is operated strictly by one man. Half Revolving and Full Revolving Types.

The BYERS Line now includes the MASSILLON Gas and Steam Shovels through the purchase of The Massillon Power Shovel Co. by the Byers Machine Co.

The Massillon Master



Shovel-Crane Equipment World 1-1 $\frac{1}{4}$ Yard

Power greater than any gas shovel of like capacity has possessed before and speed that is not equalled by any other shovel, either gas or steam, are outstanding features of the Massillon "Master" Gas Shovel. The power is centralized for maximum efficiency. The whole machine is of advanced design, notable for its simplicity and great ruggedness.

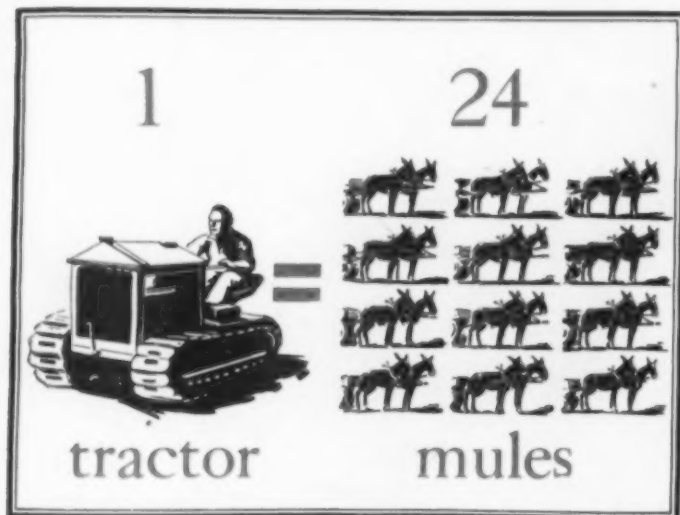
The Massillon Steam Shovel has made a name for itself because of its exceptional speed and control. The picture at right shows one of five Massillons, steam and gas, owned by a leading contractor in Ohio.

THE BYERS MACHINE CO.,
Ravenna, Ohio



Good-bye MULE!

Contractors Replace Mules with Tractors on Mississippi Levee Work



A FAITHFUL PAIR of "Missouri mocking birds," partners of the Southern darky for generations, now about to pass on.



"YAS, SUH! Us cullud boys can handle caterpillars as easy as mules."

HAULING EARTH for the levee banks. This tractor with crawler dump wagon replaces 24 mules and 6 wagons. In the background "Ole Mississippi" slumbers peacefully.





TRACTOR'S "CHUG CHUG" is sweeter to the contractor than the mule's "Haw Haw." Three tractors and two elevating graders do the heavy excavating here, pushing the mule right out of the picture.

penalty clauses, and fighting against time and rain, the "dirt" men were forced to turn to more modern methods. The mules were tough, but the job was tougher. The pictures show work in Arkansas. Tractors hauling crawler dump wagons have almost entirely retired the mules to their stables. On one job, that of M. J. Roach and his son, T. W. Roach, on the Lower Knowlton levee near Deerfield, Ark., the tractors and crawler wagons moved 100,000 cu.ft. of earth monthly.

The tractors have taken over almost entirely the gruelling, heartbreaking work of handling the elevating graders

on building up the levees and are fast replacing mules for moving the earth excavation to the levee site. Caterpillar 60's are used on elevating graders, and Caterpillar 30's on the Western-Athey 7-yd. dump wagons.

The contractors followed standard methods, building the levees in 4-ft. layers, which were compacted by the tractors, graders, mules and wagons passing above. These ascended to the levee top on runways, built up on a 10 to 1 slope.

No digging was allowed for 40 ft.

back from the levee, and then the excavation followed certain prescribed slopes back.

Large quantities of earth went into the levees. At the widest part, in Panther Forest Loop, which W. T. Lowrance and L. Lowrance & Brother built through Walker Swamp, the fill per 100-ft. section was 16,000 cu.yd.

R. T. Clark and W. C. Mullen were other contractors on the Arkansas work. They had two contracts on the loop on the Upper Knowlton levee near Ferguson, Ark.

Other levee contractors include E. H. Polk and S. K. Jones, who are building twelve stations of the Snow Lake levee, and the seven famous Lowrance brothers, North Carolinians who "went west" and are making levee building history. Besides those mentioned before, the Lowrance clan includes Lowrance Brothers & Co. and E. M. Lowrance.



"YO DON'T HAVE to cuss that tractor, boss; *she* goes!" Tractor hauling 7-yd. crawler wagon through heavy muck.

THE MULE DIES HARD. A few survivors working on the steep levee banks.





1—WHEN THE SHOVEL
ARRIVES how do you haul the
material it digs?

How do you
HAUL
what
the Shovel
DIGS?



2—HORSES AND WAGONS
can be used of course—



3—BUT IT TAKES a lot of them, and the horses sure can eat
when the weather is bad, so—



4—TRACTORS ARE USED by some contractors instead of mules
to haul the wagons, for tractors don't eat when they aren't working.
In many places—



5—MOTOR TRUCKS are successfully used in hauling the spoil, for—



6—THE ROCK WORK doesn't bother them at all, and—



8—INDUSTRIAL RAILWAY may well be used at times and—



7—THEY STAND UP to the job in winter weather, even when there's a lot of bad going. On the other hand—

HAULING WHAT



Continued from
page 29

9—THOUGH
TRESTLES COST
a good deal—

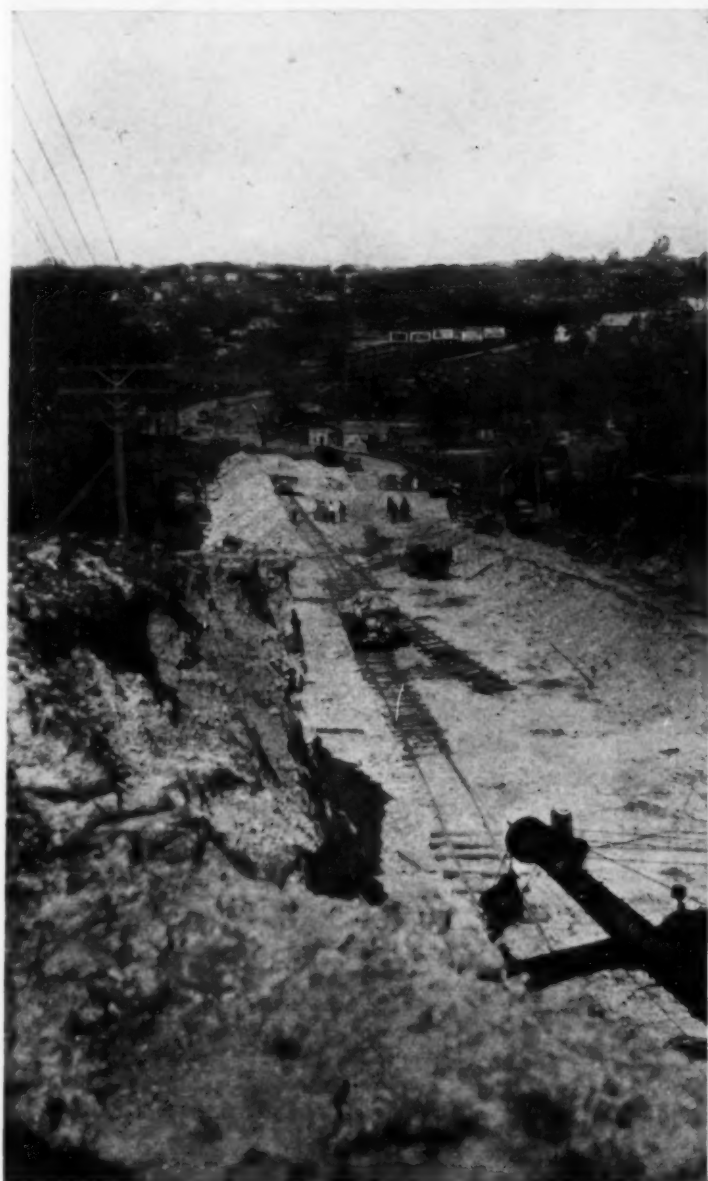
10—A LOCOMO-
TIVE and a string of
cars often prove very
satisfactory—



11—WHILE MOST CONTRAC-
TORS use engines when they install
industrial railway—



12—SOME CONTRACTORS
still find it profitable to use mules, and
even—



13—A GRAVITY RUN, with—



15—THE CRAWLER TRACTOR, with the big steel wagons it hauls, is perhaps the most modern. The amount of equipment required is limited, and if end dumping is permitted—



16—THE BULL DOZER reduces the amount of handling the earth to a minimum.



14—A CABLE AND WINCH RETURN, sometimes proves both economical and successful—

SO, AFTER ALL, there are a lot of ways to move the earth, and the main thing is to select the sort of moving equipment which will work best on the job in hand



RIGHT ON THE JOB! *Left to right:* T. Y. Johnson, superintendent; J. W. Cole, resident engineer, and Jack Greene, assistant resident engineer.

Black Top Job

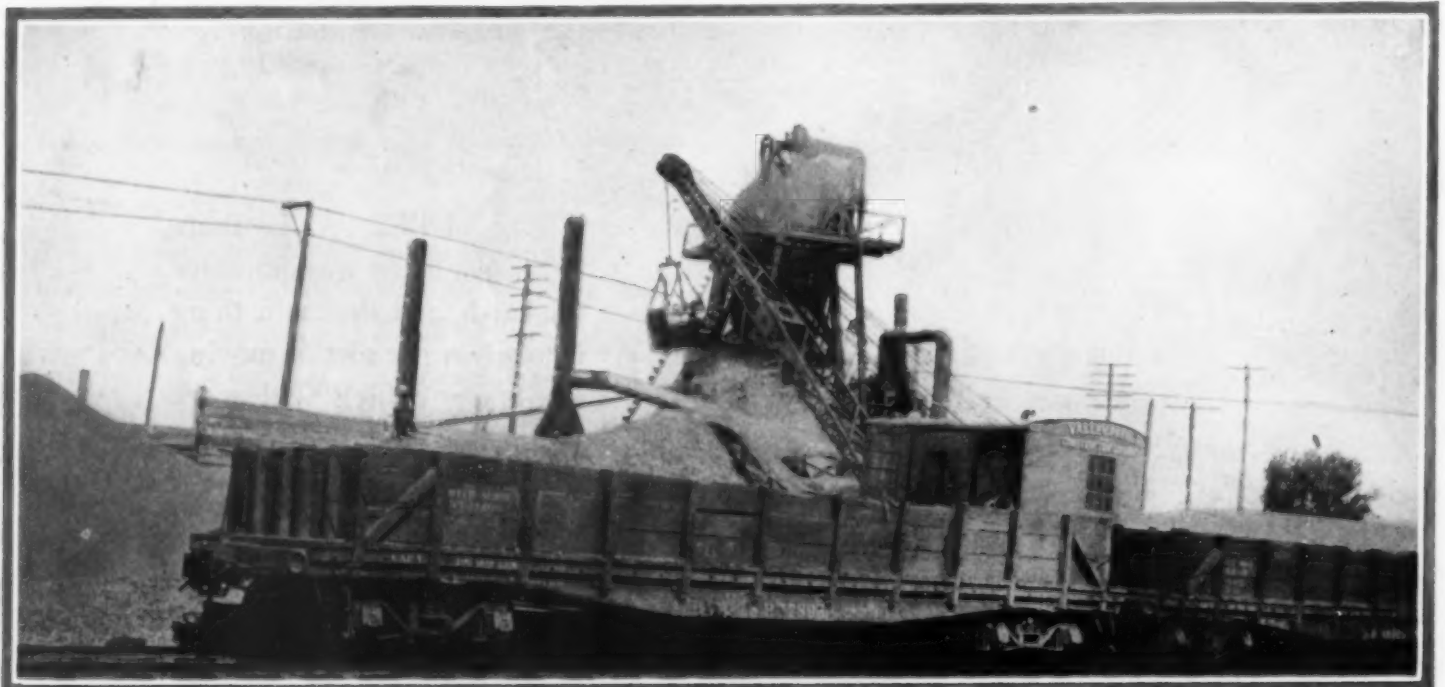
Produces Non-Skid Surface in California

TURNING OUT
600 TONS A DAY
at the asphalt plant of the Valley
Paving & Construction Company.

THE California Highway Department has almost eliminated danger from skidding on bituminous pavement by improving the method of applying the wearing surface. The accompanying photographs show the construction of a 4-in. asphaltic concrete

surface on top of an old 4-in. cement concrete slab base. Concrete shoulders involved in the same job are another prominent feature of present practice in the state.

The bottom course of asphaltic concrete contains aggregates grading down





AN IRON BAR and a Northwest crane broke up some of the old pavement that had to be removed.

in size from $2\frac{1}{2}$ in. and smaller. It is a leveling course to within 2 in. of the surface. The top course had 1-in. maximum size of rock.

In applying the surface, the old method was to mop the slab base with liquid asphalt and then scatter hot screenings. These screenings were soon brushed off by traffic, leaving a surface slippery in wet weather. Under the present specifications the screenings are thoroughly mixed with the asphalt in the mixer. The proportion of asphalt to screenings is about $1\frac{1}{2}$ per cent by weight. The mixed material is spread with a shovel, smoothed with rakes to obtain an even application, and rolled. The screenings adhere to the surface and form a coarse mat which prevents skidding. The screenings are $\frac{1}{4}$ to $\frac{3}{8}$ in. in size.

THE photographs were taken on an 8-mile job outside Modesto, Calif. The Valley Paving & Construction Co., Visalia, Calif., was the contractor. T. Y. Johnston superintended the work under the general supervision of J. W. Cole, resident engineer, and R. E. Pierce, division engineer of the state highway department.



FROM AN END-DUMP TRUCK the asphaltic concrete delivered to place.



BEFORE ROLLING (*above*) the surface was smoothed by raking, resulting in a finished surface (*below*) on which motor vehicles may travel without skidding even in wet weather.

How *Mexico*

[[American engineer tells of roadwork
in mountainous Mexico]]

Builds Her Highways

By C. N. CONNER

*Former Chief Engineer on Mexican Highway Construction
Now with the Highway Research Board, Washington, D. C.*



Following the recent article published in *Construction Methods* dealing with bridge construction on Mexican highways, we are presenting this month some details of Mexican road construction. C. N. Conner, the author, spent nearly a year in Mexico and is now with the Highway Research Board at Washington, D. C. He took the pictures shown in the article.

TYPICAL GROUP OF LABORERS.

"They are excellent workmen and cheap (about 75c. a day)," says Mr. Conner.

THE importance of highway construction has been realized for some time by the Mexicans, but it is only a little more than a year ago that they began actual construction of a highway system, using modern methods, with American engineers in charge.

Mexico is suffering from a lack of means of communication, principal among which are telephones and highways. As one engineer expressed it, "They have been waiting 400 years for something to drive over, and it's no wonder that traffic on the highways already completed has increased from

10 to 100 vehicles per day in a few months."

After a year under American guidance on the construction of 500 kilometers of highways, the Mexicans are now planning to go ahead without the foreign engineers. On account of the somewhat limited finances of 12,000,000 pesos (roughly \$6,000,000) per annum, the roads have been built entirely of local materials such as tezontle, tepetate, volcanic cinders, gravel and stone.

These surfaces, after shaping and compacting, are treated with asphaltic oils. They will carry without excessive

maintenance from 600 to 1,500 vehicles per day. Later, of course, hard surface pavements will be required, especially near the larger centers of population.

The photographs show the heavy construction in the mountains where much of the work has been done. As the greater part of the Republic is more than 5,000 ft. above sea level it readily can be seen that a large portion of the finances will be consumed in this heavy grading.

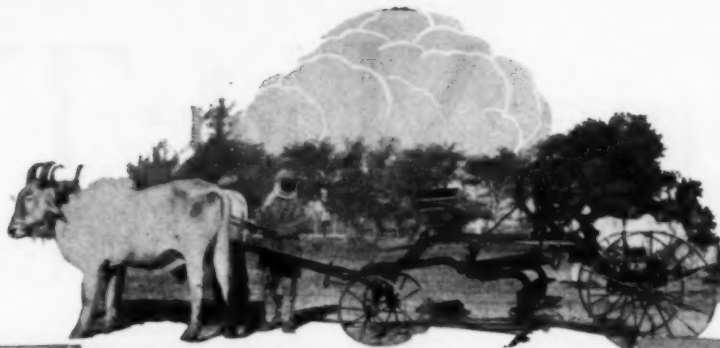
The future prospects seem good as there is a real demand and desire for highway construction.



MODERN MACHINERY ON THE JOB—a road roller from the U. S. A.



OILING ROAD SURFACE with up-to-date pressure distributor. Half the road is treated at a time.



NO HORSE-POWER USED for operating this American highway maintenance grader outfit in India. It looks like zebu-power to us, but if that isn't correct, write your own ticket.

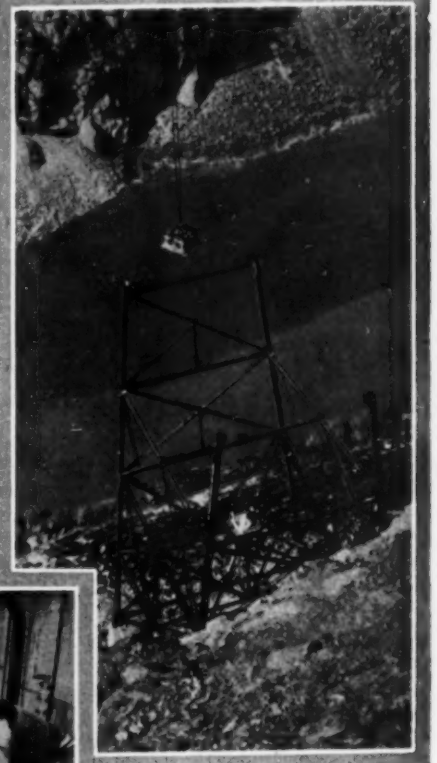


"JACK-OF-ALL-TRADES" describes this power shovel. Between shifts of highway subgrade excavation for the A. Haidlen Co. near La Moine, Calif., it loaded a concrete mixer on a 5-ton truck for transfer to a new job. Picture from K. H. Tatlow.

JOB ODDITIES

For this page the Editor wants snapshots of unusual construction details

What's ODD on your work?



ONE WAY TO AVOID the rush-hour subway jam in getting to and from the job. Plenty of fresh air for these men, homeward bound via cableway, after erecting steel for tower of the Twin Falls-Jerome cantilever bridge over Snake River Canyon in Washington.



©P 4 A

ALPINE CLIMBING TECHNIQUE is necessary for these glaziers, busy on the annual job of repairing the roof of the Crystal Palace in London.



©International

CONSTRUCTION'S "DAISY CHAIN," showing the Vassar College influence on the highway job when water hose has to be moved ahead to keep up with the concrete mixer.



Home Made Tools

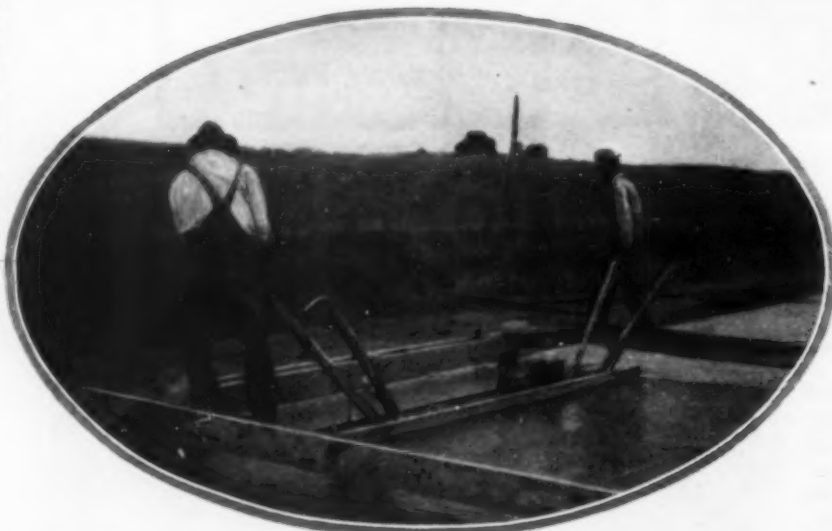
for the Concrete Paving Contractor



GETTING A SMOOTH FINISH on the pavement is one of the most important details in first-class pavement work. *The long-handled float* should be wide—from 3 to 5 ft. long—and slightly beveled on the edges, so it will not gouge the pavement in moving back and forth.

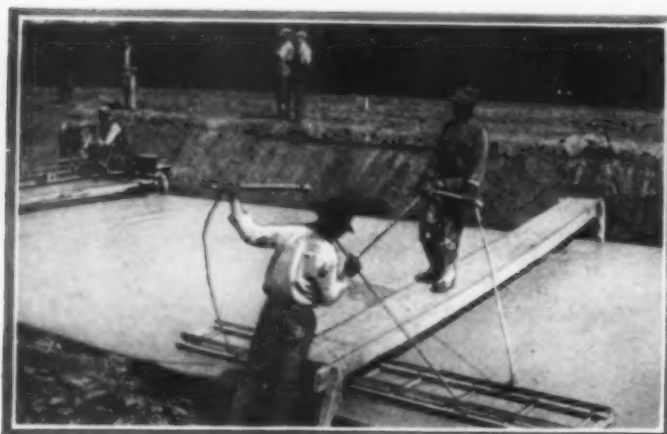


ANOTHER AID in obtaining a smooth surface is *the longitudinal float*. The usual design, shown above, is operated from a double bridge, but as it is narrow, it tends to gouge the pavement.



BETTER RESULTS are obtained by a design generally similar but using *a bottom on the float*. In the design shown above the bottom of the float may be a light channel. The desired

effect is obtained by dragging the float back and forth from the bridge, the forward edge being lifted a little to prevent gouging and produce a surface having good riding qualities.



THE SMOOTHEST FINISH is obtained with *the North Carolina float*, dragged across at a slight angle. The float is 10 to 12 ft. long, 15 in. wide, and is built up on steel angles. Rounded edges prevent gouging.

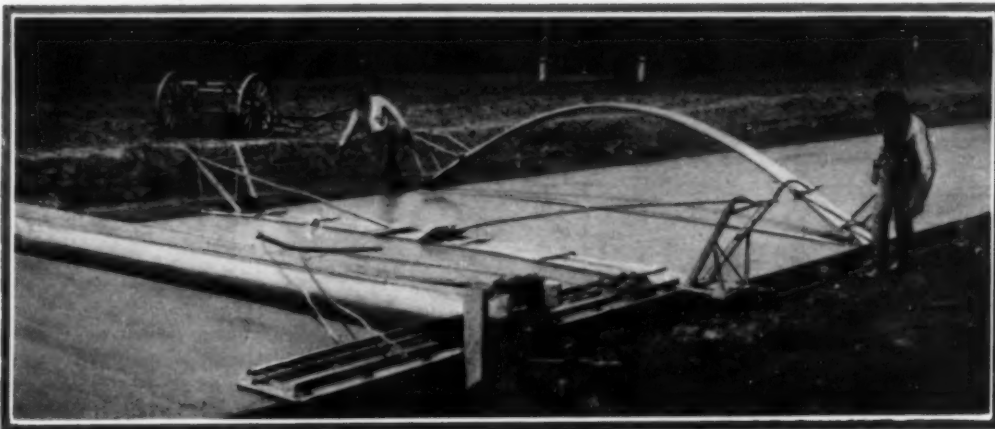


SOME CONTRACTORS PREFER to operate the float by means of *long handles*. This works very well if there are no deep cuts which would interfere with the movement of the handle back and forth.

Some Handy Devices for Finishing, Laying Burlap and Pulling Forms



AFTER THE FLOATS some contractors use the *wooden belt*, as shown above, and find it very effective. After this—



THE FINAL FINISH can be applied with the *bow belt*. The bow maintains a uniform pull on the belt, which is dragged forward without any sawing motion. Besides finishing tools—



THE CONTRACTOR USES a variety of bridges. Here is one *on rollers*, used for laying burlap. It is easier to move than those resting on the forms or on the ground outside, as shown in the other pictures.



GOOD FORM PULLERS save time in rooting out tight forms. Those above were made of *timber* and—



THESE HUSKY "ROAD DENTISTS" were built up from *pipe*. With these form pullers two men can quickly yank out a day's forms without damaging slab.

Let's hear from you

Well, this is how the other fellow's doing it. How about *your* job? Built any new rigs that *work*? If so, why not send pictures of them to us?

We'll do the rest!



REACHING UP
to set the hip trusses
over the choir loft.

75-ft. Gin Pole

Aids Cathedral Steel Erection

SPECIALIST in church construction, the Math. Raven Company of Chicago is completing at Springfield, Ill., from plans of J. W. McCarthy, Chicago architect, a group of buildings for the Cathedral of the Immaculate Conception. In addition to the main cathedral structure, the group includes a rectory, a school and a convent, built

as a unit on a plot of ground having dimensions of 200x235 ft.

From the construction point of view the main feature of the job is the use of a 75-ft. gin pole for erecting the steel work in the frame of the cathedral, which has dimensions of 86x180x65 ft. For the walls monkey derricks set 45,000 cu.ft. of Mankato stone.



HOW THE LONG GIN POLE WAS RIGGED to erect
the steel frame and roof trusses for the big cathedral.



PATROL UNIT. Truck and grader—trims 10 to 15 miles of highway ready for gang units to finish with gravel.



FOLLOWING UP. Gang unit truck dumping gravel on road between Salt Lake and Park City. Each gang has two to five trucks.

Highway Maintenance *in* Utah

UTAH, with 3,000 miles of road within its borders, has organized highway maintenance by using a combined gang and patrol system. The units work together, patrols covering from 10 to 15 miles of road, and gangs following the work of two patrols.

The patrols use graders, hauled by trucks in the valleys, and by horses on the hillsides. They trim the road preparatory to finishing with gravel by the gang units. The gang units use fleets of

trucks which haul gravel from crushers, fill low spots, build up the road shoulders, and do heavy grading.

The maintenance corps is directed by E. C. Knowlton, state maintenance engineer, who has five district engineers under him. With winter approaching he plans to keep 2,000 miles of highway open with rotary snow plows, working up to a level of 9,000 ft. After that height the snow will compel cessation of work.



THE HEAVY ARTILLERY. Ten-ton tractor and grader used by gang units for heavy duty.

Work Against Time to Repair Flood-Damaged Highways *in* MISSISSIPPI VALLEY



CRACKED AND HEAVED by the flood waters, these slabs were all that remained of the concrete highway between Little Rock and Hot Springs.

MOVING HOUSES off Route 4, where they had been carried by the flood, was one detail in the relief work near Arkansas City.



CLEARING ROADS of flood debris was the first job to be done after the water receded. Tractors moved 28 houses off of this stretch of Route 4.

WORKING under the direction of the State Highway Department, contractors' organizations and equipment supplemented by day-labor forces are rushing the work of reconstruction and repair on flood-damaged highways and bridges in Arkansas. This is one of the states that suffered most from the rampage of the Mississippi River last year. In the southeast section of Arkansas, the flood damage was particularly severe.

Highways were scoured out or buried under many feet of silt deposited by the flood, drainage ditches were filled up and

Arkansas Contractors and Forces of State Highway Department Rush Reconstruction of Roads and Bridges

bridges were completely demolished or had their decking floated off. To bring order out of the chaos imposed a huge task on the state's engineering and construction forces. Reconstruction work is now in full swing, and the accompanying photographs by V. B. Smith, editorial field representative of *Construction Methods*, give an idea of the character and extent of the damage done in Chicot and Desha counties, and the methods and equipment being used on the emergency repair work.

A break occurred in the Arkansas River levee at Pendleton, approximately 40 miles below Pine Bluff, on April 19. The flood waters spread over the country in a veritable wall. They entered the lowest part of Lake Village, county seat of Chicot County, the morning of April 26, and in three hours had risen to

a height of 5 ft. It was this moving crest of water that was responsible for the most serious highway damage. In bayous and ditches the rushing flood and accumulated drift proved more than bridges could resist. As the flood swept down natural hollows, it washed away sections of the fills which blocked its path.

HIGHWAYS SUBMERGED SIX WEEKS

Highways in the two counties were covered for an average period of six weeks. Of the 890 miles of state roads in District 2 of the Arkansas Highway Department, with headquarters at Pine Bluff, of which these counties form a part, 600 miles were under water. All level land in Chicot and Desha counties was inundated to a depth of from 4 in. to 15 ft. The long immersion caused the

gumbo material of which the fills are composed to swell. As the fills under paved roads dried out after the waters had receded they left the pavement unsupported in many places, and this failure of the foundation has caused considerable cracking and break-up of the slab. As for the rest of the damage, it is estimated that nearly all of it occurred during the first week of the flood.

RECONSTRUCTION FOLLOWS RECEDING WATER

Reconstruction followed the water as it receded. Work was supervised by resident engineers of the State Highway Department, of whom there were three in the two counties. As the various highways drained at different times, work could be carried on successively



BURIED under 5 ft. of silt! Mule-drawn fresnos clear Route 35 near Gaines Landing.

RESPONDED TO S. O. S. These highway engineers had a strenuous battle when the flood hit Arkansas. They are (left to right): L. Bearden, resident engineer; A. S. Madding, district engineer; H. Haberyan, county supervisor, and E. Hale, civil engineer.

DRAGLINE operated under contract by Kochtitzky Bros., of England, Ark., cleared sediment-filled ditches at Halley.



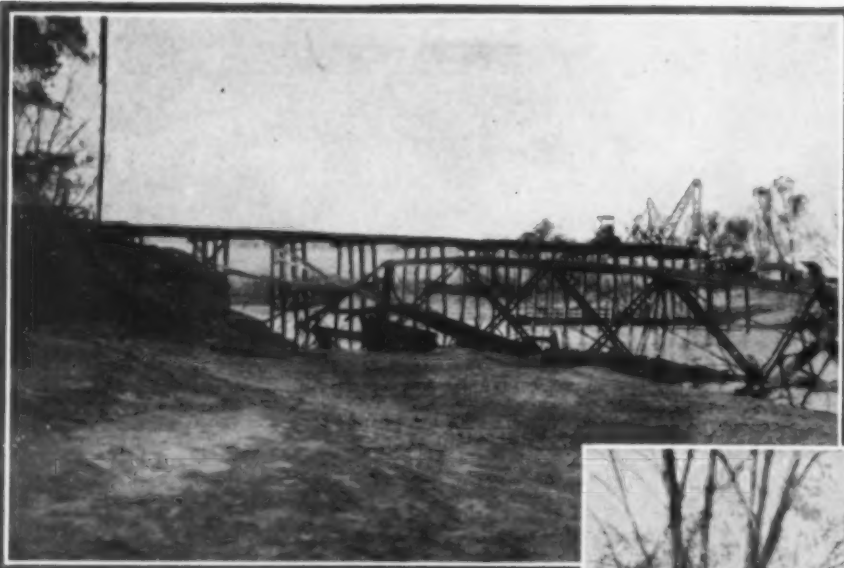
NEW BRIDGES were quickly erected to replace structures that went out with the first rush of the flood. J. F. Mullins, contractor, of Pine Bluff, handled the emergency work. In some cases only the decks were floated off and were replaced.



Repairing Flood Damage

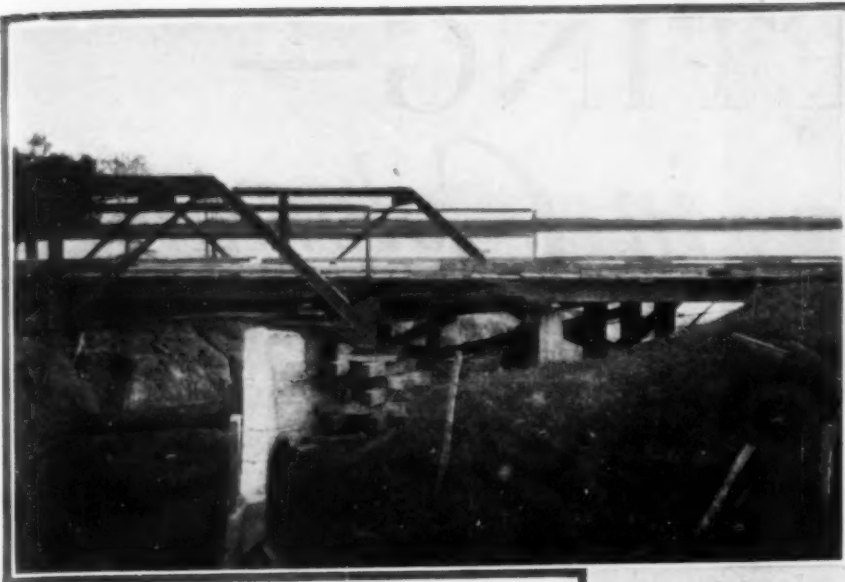
on the separate roads as they were uncovered. As many day-labor crews as could be used were employed. They were put to work with trucks, tractors, scrapers, and tools already on hand. Temporary bridges were built where needed, and gaps in the fills were connected with temporary runways. The roads were cleared of accumulated logs, houses, and smaller drift. As the work progressed, attention was turned to rebuilding the fills and erecting permanent bridges. The counties operated ferries at many points where bridges were missing.

One of the big preliminary jobs was to clear the routes of flood wreckage before real reconstruction could start. On one section of Route 4 near Arkansas City, for example, the highway department forces had to remove 28 houses which the rushing waters picked up and deposited on or near the right-of-way. Both tractors and teams helped speed up this part of the work. The debris, removed from the highways, was



UNDERMINED PIERS and abutments caused collapse of steel-truss bridge (*above*) along Lake Chicot. Replacement being made (*at right*) with creosoted timber structure on pile bents. Day-labor forces of the Arkansas State Highway Department are handling this job.





TEMPORARY CRIBBING supports this one-way steel bridge undermined on Route 2.

TENTS housed the flood relief construction crews at Connerly's Bayou bridge



Damage in Mississippi Valley

piled up alongside of them and burned.

Another important feature of the repair work is the cleaning out of side ditches which had been filled with silt. Draglines are proving effective machines for this operation and one of the pictures shows a P&H machine with a $\frac{3}{4}$ -yd. bucket on Route 35 at Halley.

The bridge reconstruction work is making a heavy demand on piledriving equipment. A typical rig with a 2,000-lb. Vulcan drop hammer and tractor hoist is shown in the photographs.

WHEN the first flood warning came, all of the highway bridges in Chicot and Desha counties were weighted down, and the decks were anchored with wire rope cables to trees and deadmen. In spite of these precautions, four timber pile bridges and two steel bridges were washed out—four of them during the first 18 hours of the flood. To provide temporary detour bridges, timber from wrecked structures was salvaged and used.



A CONTRACT JOB on which Atkinson Bros., of Pine Bluff, are driving piles for a timber bridge to fill a gap opened up in Route 4 at Cutoff Creek.



PILE DRIVER on timber bridge construction is operated by tractor hoist. Resident Engineer L. Bearden and Bridge Superintendent W. M. Rose supervise the work.

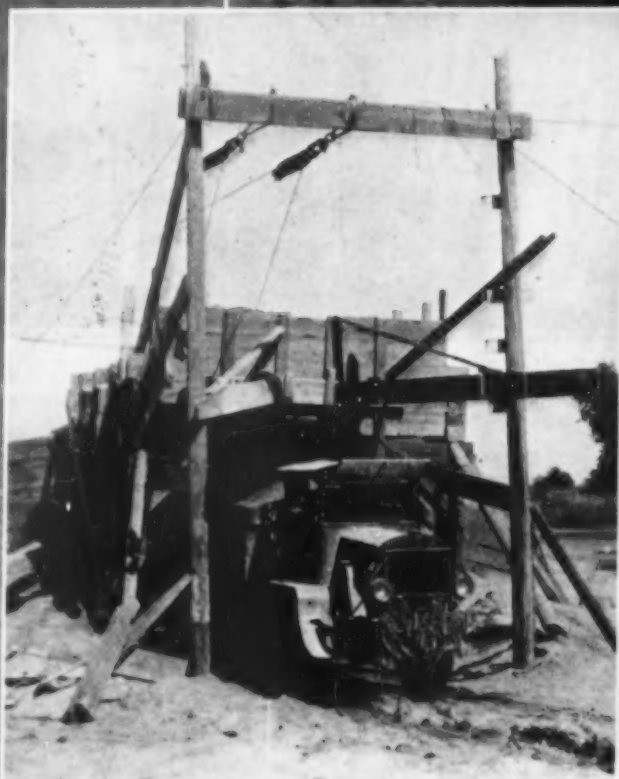
CONCRETING— *in Colorado*

*Paving contractors
dig river sand and
haul direct to mixer*



Above—DIGGING SAND direct from the South Platte River with a dragline bucket. Sauer-
man $\frac{1}{2}$ -yd. bucket operated by
Novo hoist pulls the sand by
cableway to the top of the plat-

form. Trucks below load from
a cutoff gate. The sand is ex-
ceptionally clean and sharp and
is used for the concrete paving
without any further washing
than it received from the river.



LOADING
TRUCK WITH
SAND.

THESE photos were taken on project 288-A-2,
Colorado State Highway Department, consist-
ing of a section of concrete pavement, 9.71 miles
long and 18 ft. in width, between Merino and Brush.
It varied in depth from $6\frac{1}{2}$ to 9 in. The work was
done by Edward Selander, contractor, of Fort
Morgan, Colo., under the supervision of W. A.
Lewis, resident engineer. L. J. Hesser was superin-
tendent for the contractor.

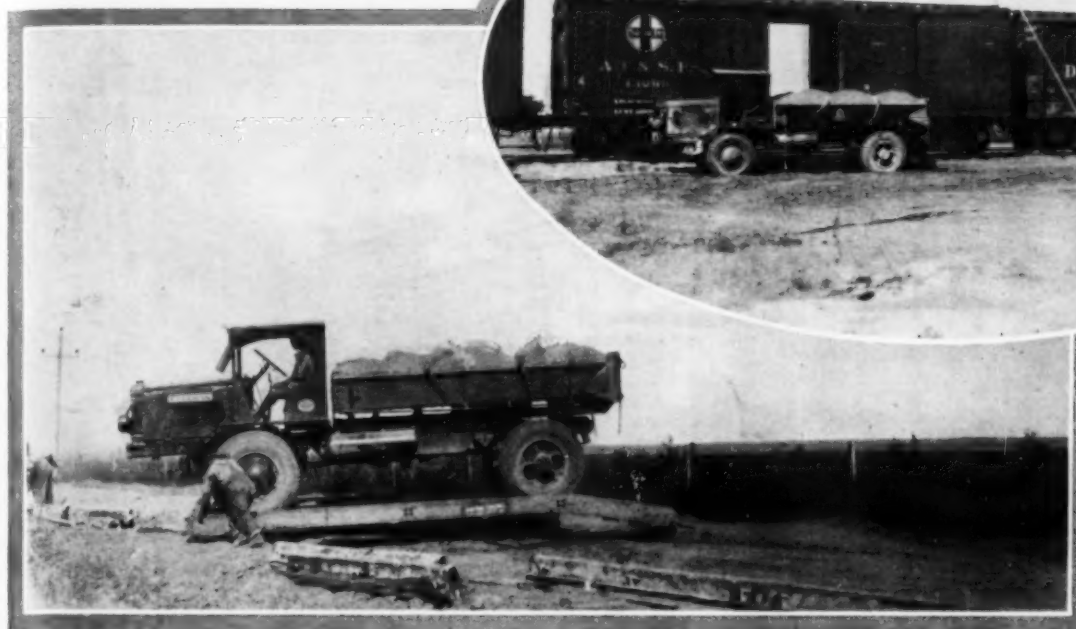


TRANSFER-
RING SAND
with Koehring
crane from stock
pile to bins, ready
for batching.

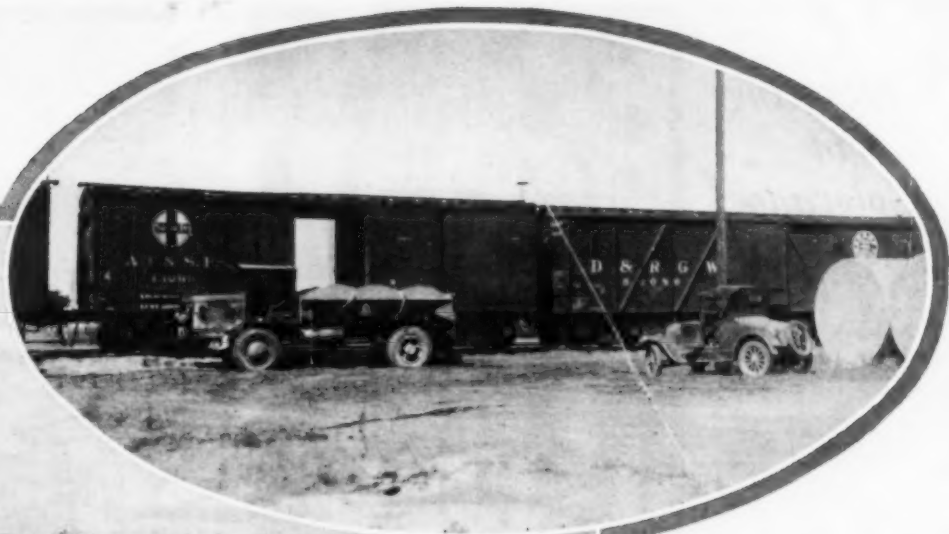
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A-2,
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METHODS



ROUND IT GOES! Arriving at the mixer, the truck runs on a Blaw-Knox turntable, which wheels it into position to discharge into the skip.



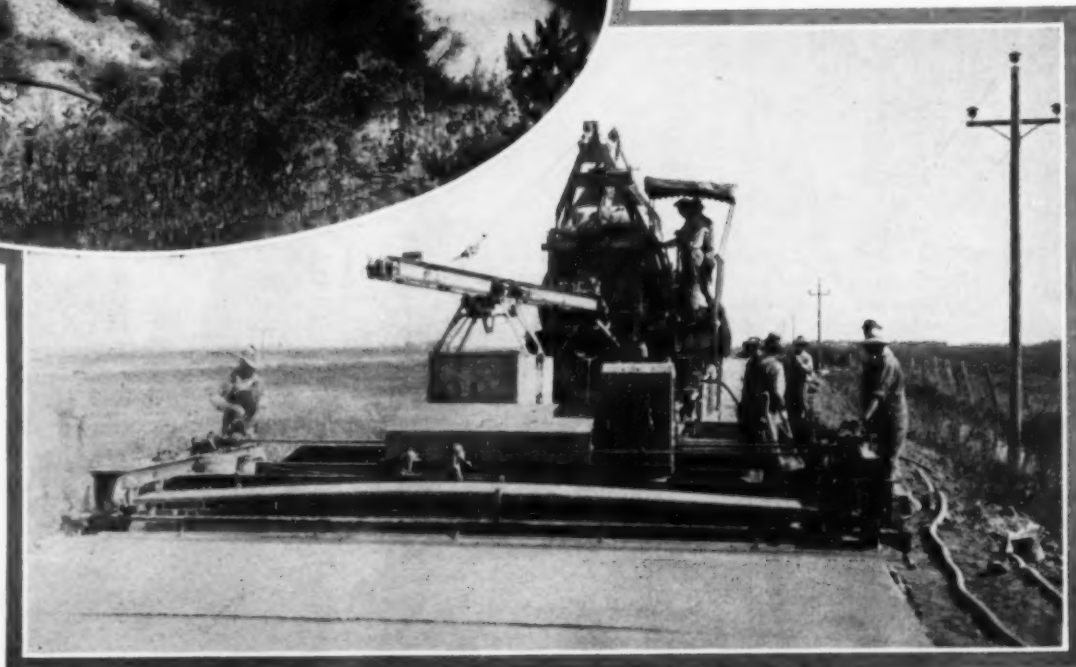
GETTING CEMENT from the railroad. Truck partly filled with sand receives proper ration of cement at siding.

Concreting in Colorado



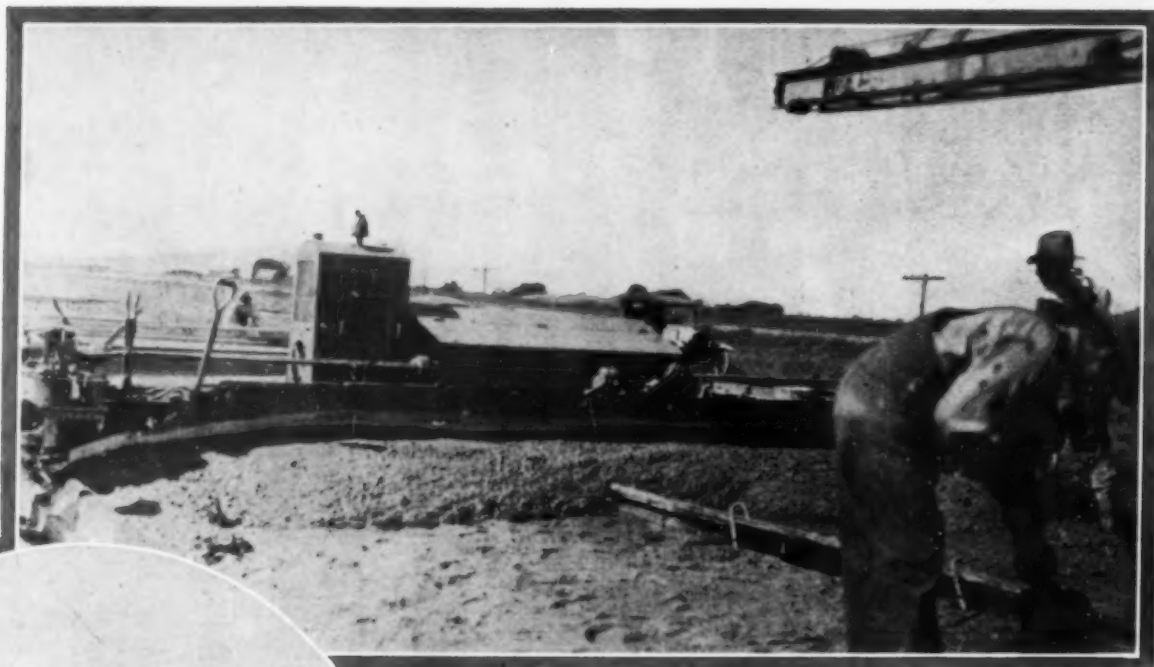
PUMPING THE WATER from a nearby irrigation ditch; a C. H. & E. portable pump took care of the water supply.

THE FINISHER PASSES ON, leaving transverse joint as shown at right. Mixer in rear.



Concreting in Colorado

(Continued from p. 45)



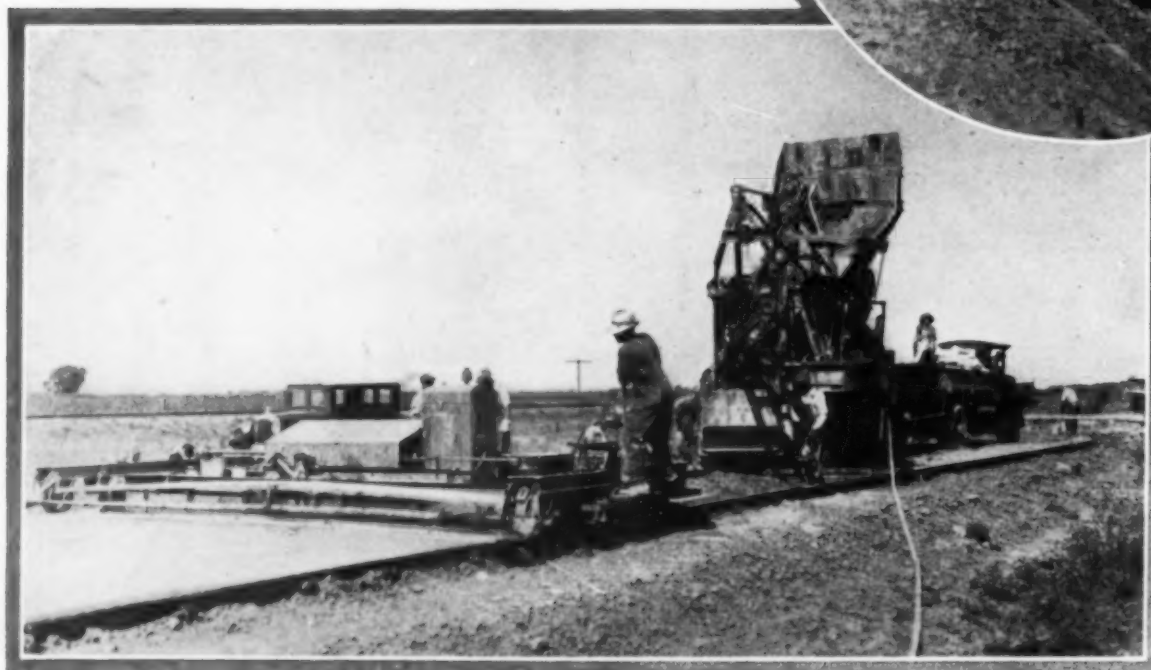
HOLDING CENTER STEEL PLATE in place while concrete goes down. Sand layer under concrete is 2 to 4 in. thick.



SAND PILES on subgrade. These were struck off to proper level by a strike-off board riding in front of the mixer.



MOVING FORMS (above). Due to ground conditions, a drag sled was found most suitable.

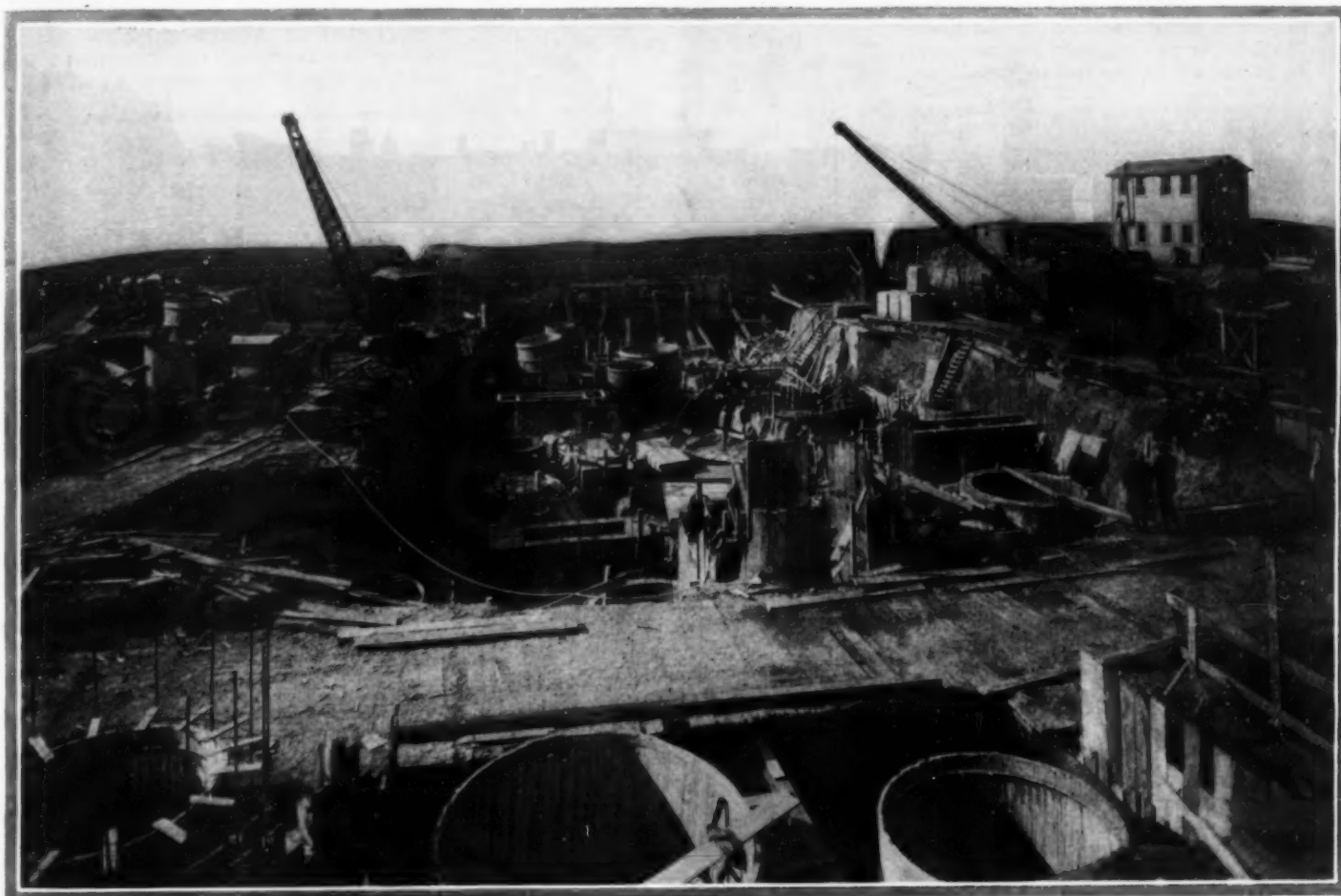


THE COMPLETE PLANT—Ord finisher, Foote mixer, and Coleman truck in the background.

Sinking OPEN CAISSONS

[[Contractors Drive Concrete Pier]]
Cylinders 60 ft. to Bedrock]

in St. Louis



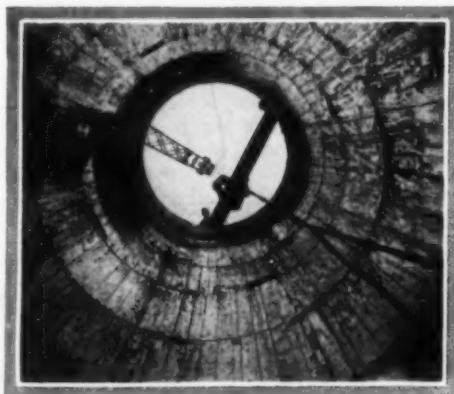
GOING DOWN! Caissons in all stages of construction on their journey downward, 60 ft. to bedrock. Cranes sunk the caissons, built in 10-ft. hollow sections, by digging

inside them with buckets. The cylinders were weighted down with large concrete blocks, shown under the boom of the crane at the right.

IN CONSTRUCTING 62 concrete piers for the foundations of the Civil Court House, St. Louis, Mo., the contractor, the Fruin-Colnon Contracting Company of St. Louis, used the open-caisson method. They experienced little trouble in sinking all the piers to bedrock, at an average depth of 60 ft.

E. C. Dicke of the contracting company developed the plans for the caisson system. He built reinforced concrete shells with the same outside dimensions as the piers, and filled them with concrete after they were sunk to firm bearing. Of the total number 40 were circular (7 ft. 3 in. to 11 ft. 11 in. in diameter) and 22 were rectangular (5 x 12 ft. 8 in. to 7 x 16 ft. 4 in.).

They went down in 10-ft. sections, with a crane bucket taking out the ma-



GOING UP! Taken from the bucket in the bottom of a caisson just as it was about to be hauled upward. The crane boom hovers above. Note the ring sections, each marking a 10-ft. lift. How far are we down? Count 'em!

terial encountered on the inside. The bottom of the lowest lift carried a 2-in. cutting edge, unprotected by timber or steel, but well reinforced.

Two of the caissons struck quicksand and trouble threatened, but the digging was speeded up, and the shells driven through to clay.

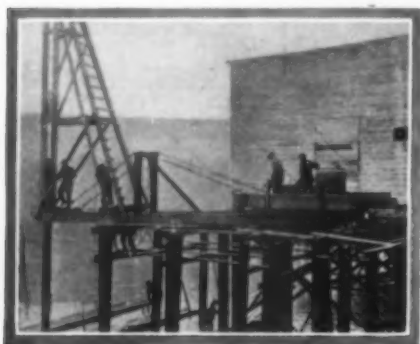
Superintendent George Newell handled the mixing economically. He dug a recess for the mixer in the side of the excavation, below the ground level but above the pouring line for the caissons. Trucks, above, dumped into the mixer, and carts below carried the batches to place.

R. Weinberger, as resident engineer for St. Louis, supervised the construction, under the direction of E. R. Kinsey, president of the Board of Public Service.

NEW EQUIPMENT ON THE JOB

New Hoist Built With Three Speeds

An automotive hoist with three speeds to meet all kinds of load conditions is being marketed by the Ersted Manufacturing Company, Portland, Ore. It is shown in the photograph being



used on a pier. Selective gear transmission adapts the power of the hoist to the work being done, and full ball bearing construction increases the efficiency in transmitting engine power. The hoist is light and compact, making its use possible in many locations where it would be impossible to set up a heavier machine.

New Portable Pump Weighs Only 95 Lbs.

A new portable centrifugal pumping unit weighing only 95 lb., and with a capacity of 7,500 gal. per hour, is being marketed by the Homelite Corporation, Port Chester, N. Y. It has a bronze



open type impeller direct connected to a 1½-hp. single cylinder air-cooled motor operating on gasoline or kerosene.

Pump and engine are mounted on the same base which also acts as a fuel tank, holding 1 gal., sufficient to operate the engine for 4 or 5 hours. The lift of the pump is 20 ft.; head, 45 ft. It will handle muddy, gritty water; oils, chemicals or anything that will pass through the foot-valve strainer.

The engine being air cooled, the outfit is independent of cooling water supply and can be used even in the lowest temperatures.

Bottom Dump Truck For Wet Concrete

A new truck body with a bottom dumping arrangement, designed to speed handling of wet concrete and hauling from central mixing plants, has been put on the market by the Hug



Company of Highland, Ill. It is particularly well adapted for ready mixed concrete, the manufacturers claim.

The body is unique in that the side lifts up from the bottom, offering a practical solution to the problem of handling wet concrete speedily. This dumping scheme shakes up the batch and remixes it as it leaves the body. The entire operation is controlled automatically from the driver's seat. As a hydraulic hoist raises the bottom, steel toggle arms detach the sides and elevate them.

Portable Saw Is Run By Electricity

The Wolf portable timber saw, operated and sold by the Reed-Prentice Corporation of Worcester, Mass., is finding many uses on construction work. Although only recently put on



the market, a number have been installed in shipyards, on trestle work, mine timbering, sewer jobs and in other locations.

Of the Wolf saw used in the Tottenham, S. I., shipyard, shown in the photo, Peter C. O'Connor, the superintendent, says, "It went through the timbers, whose cross-section was 4½ sq.ft. in 3½ minutes actual cutting time."

Roller-Body Truck Speeds Unloading

The new "Lumberjack" truck, which will be exhibited for the first time by the Hughes-Keenan Company at the Cleveland Road Show, is designed to speed the loading of lumber, tile, brick,



and other materials, by sliding them off with a rolling device from the truck body.

When the truck is ready for unloading the entire platform body is rolled back until the rear end of the load drops easily and smoothly to the ground.

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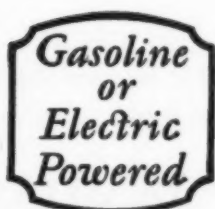
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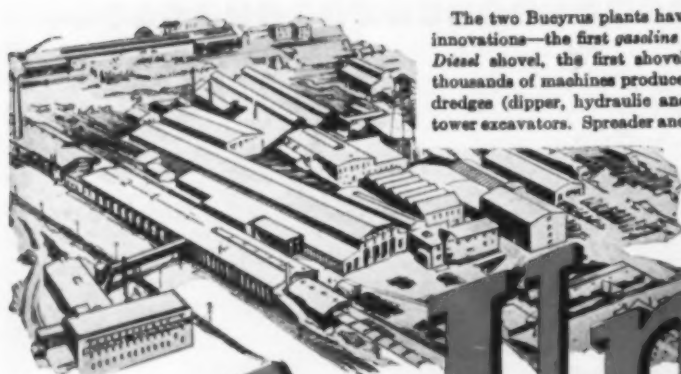


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A Complete Line of Excavators backed by Unequalled and Service

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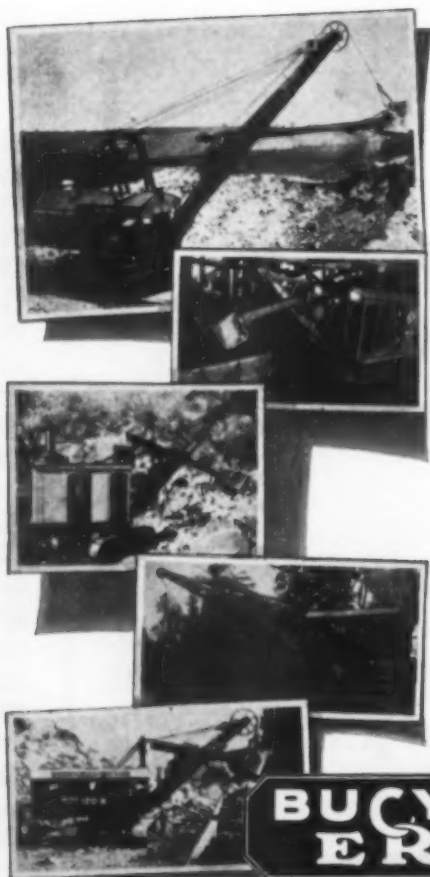
With plants and organizations which, combined, have built nearly twice as many excavating machines as any other manufacturer.

Never before has such a fund of sound and reliable experience been concentrated on one line—experience gained in the design and manufacture, and service in the field, of many thousands of excavating machines.

For many months BUCYRUS-ERIE engineers have worked out new features and designs that mean *extra value to the buyers of shovels, cranes, draglines, dredges, ditchers, etc.*

The customers of BUCYRUS-ERIE can safely count upon—

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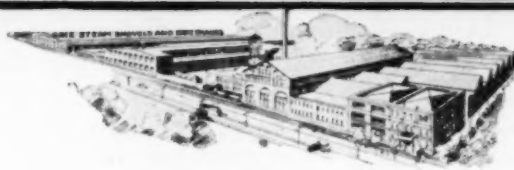
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HOISTS CLYDE DERRICKS

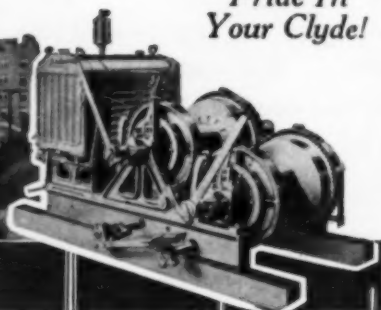
In the illustration below is shown the addition just built to the Baptist Memorial hospital at Memphis, Tennessee by the Kaucher-Hodges Construction Company. A Clyde 35 horse power, two drum gasoline hoist was used on the main tower and handled all materials economically and to the satisfaction of its operators.



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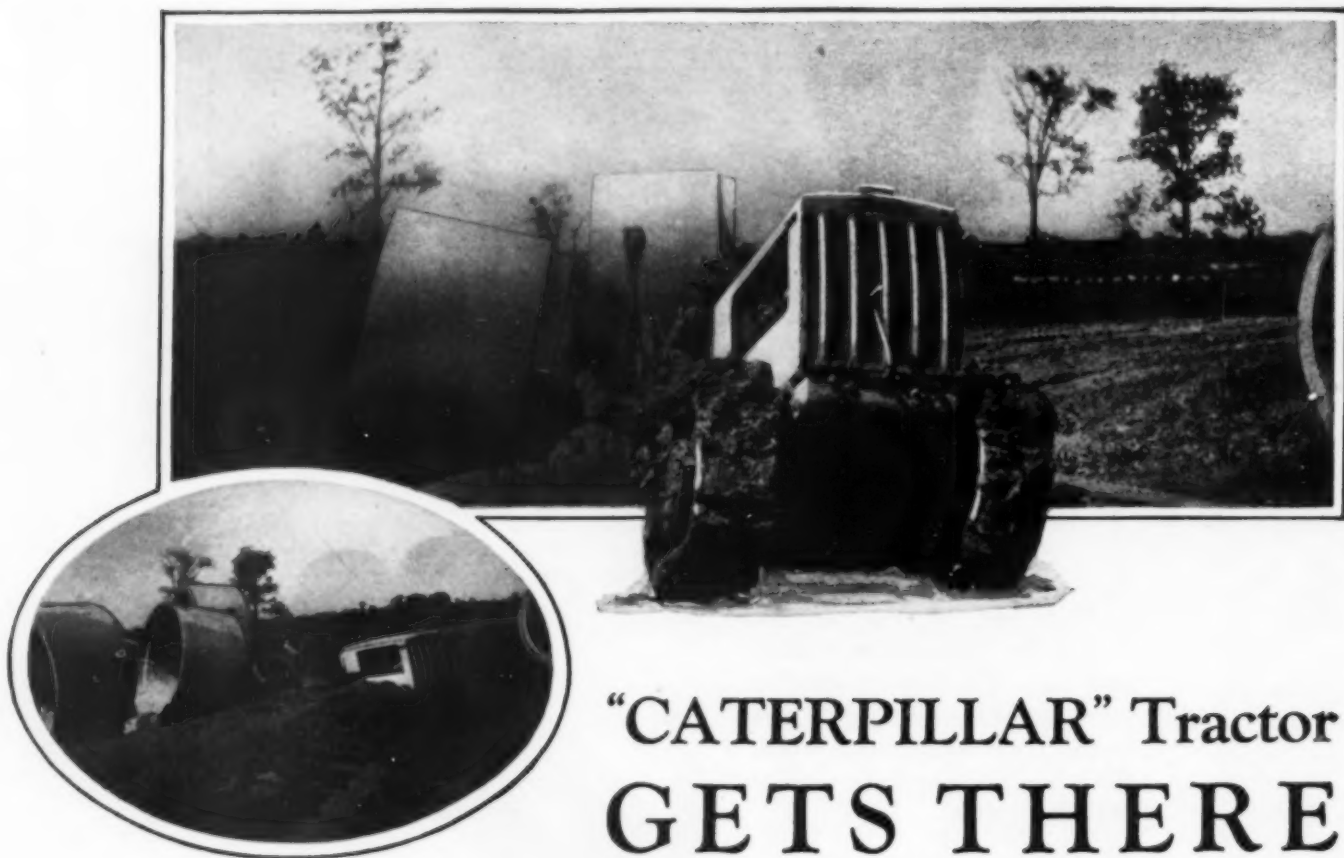
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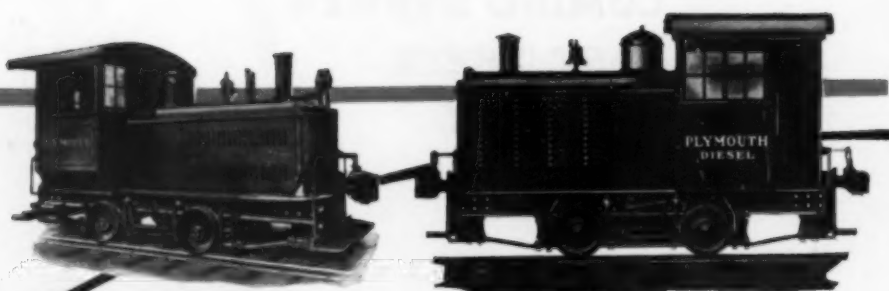
AT THE

ROAD SHOW

CLEVELAND, OHIO

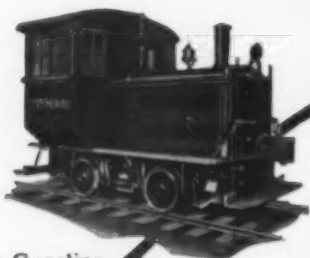
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BOOTH AA-2



14 ton Gasoline

15 ton Diesel



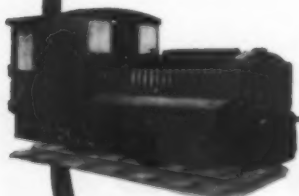
12 ton Gasoline



10 ton Diesel



8 ton Gasoline



5 ton Gasoline



4 ton Gasoline



2 ton Gasoline

The **PLYMOUTH LINE OF GASOLINE AND DIESEL LOCOMOTIVES IS COMPLETE FROM 2 TON TO 50 TON SIZES**

Each size and model a sturdy, rugged, trustworthy power unit—representing that excellence in engineering and design which is typically PLYMOUTH in Locomotives.

Like certain motor cars, buses and trucks, pre-eminently desirable thru their economy, long life and lasting satisfaction, Plymouth Locomotives also stand out in front of the line of competition with these same characteristics strikingly proven.

Rail haulage and Plymouths with their many advantages in economy and reliability are being adopted by scores of industries in America and foreign countries. This marked economy has created a demand for large sizes to meet the needs of an ever-increasing number of uses.

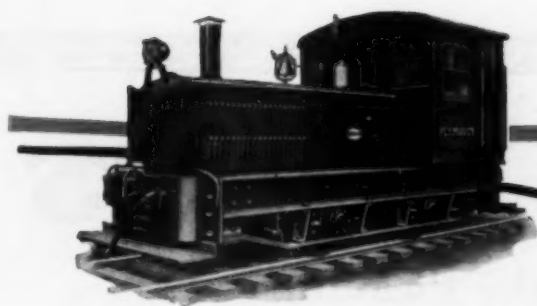
If your logical fuel is oil, your haulage problem is most economically solved by the Plymouth Diesel. If it is gasoline, then the Plymouth Gasoline Locomotive is the proven solution.

With a range of 24 standard models from two to fifty ton sizes for any track gauge, there is a Plymouth to solve your problem—and solve it economically.

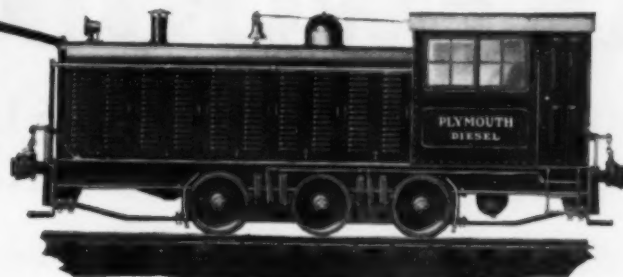
PLYMOUTH LOCOMOTIVE WORKS
The Fate-Root-Heath Company
PLYMOUTH, OHIO

See our exhibit at American
Good Roads Show, Cleve-
land, Jan. 9-13.

***If It's a Track Haulage Problem
There's a PLYMOUTH to Solve it***



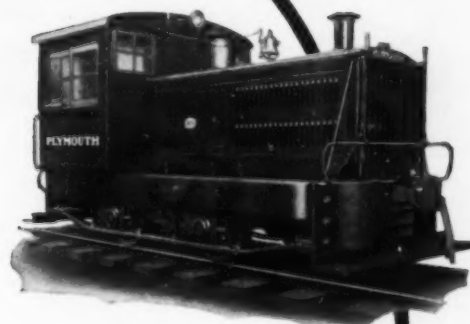
18 ton Gasoline



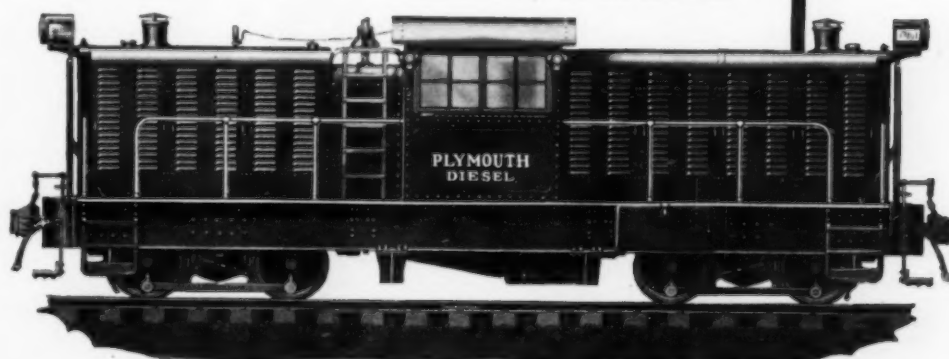
25 ton Diesel

PLYMOUTH GASOLINE AND DIESEL
LOCOMOTIVES ARE BUILT IN THE
FOLLOWING STANDARD SIZES:

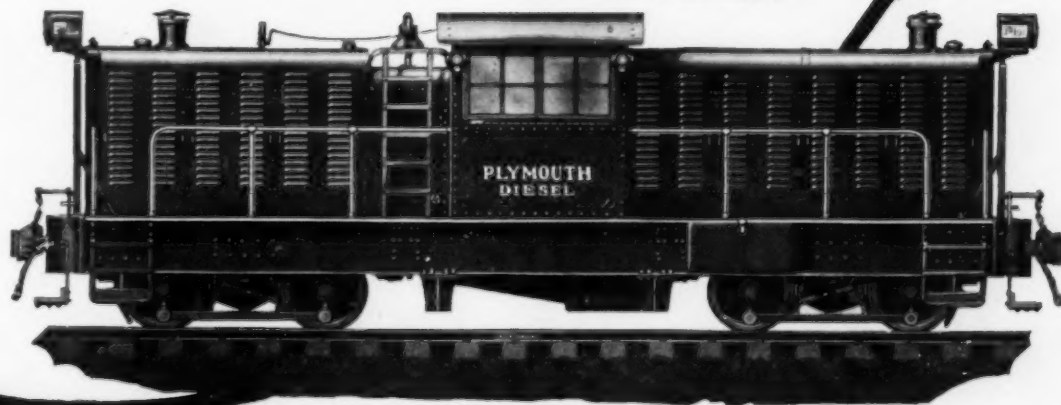
2 ton Gasoline	8 ton Gasoline	20 ton Gasoline
2½ ton Gasoline	10 ton Gasoline	20 ton Diesel
3 ton Gasoline	10 ton Diesel	25 ton Gasoline
4 ton Gasoline	12 ton Gasoline	25 ton Diesel
4½ ton Gasoline	12 ton Diesel	40 ton Gasoline
5 ton Gasoline	14 ton Gasoline	40 ton Diesel
6 ton Gasoline	15 ton Diesel	50 ton Gasoline
7 ton Gasoline	18 ton Gasoline	50 ton Diesel



25 ton Gasoline



40 ton Diesel



50 ton Diesel

PLYMOUTH
GASOLINE *Locomotives* DIESEL

LAKEWOOD *Mixers*

Mixed the Concrete for The Lake Pleasant Dam,
near Phoenix, Arizona



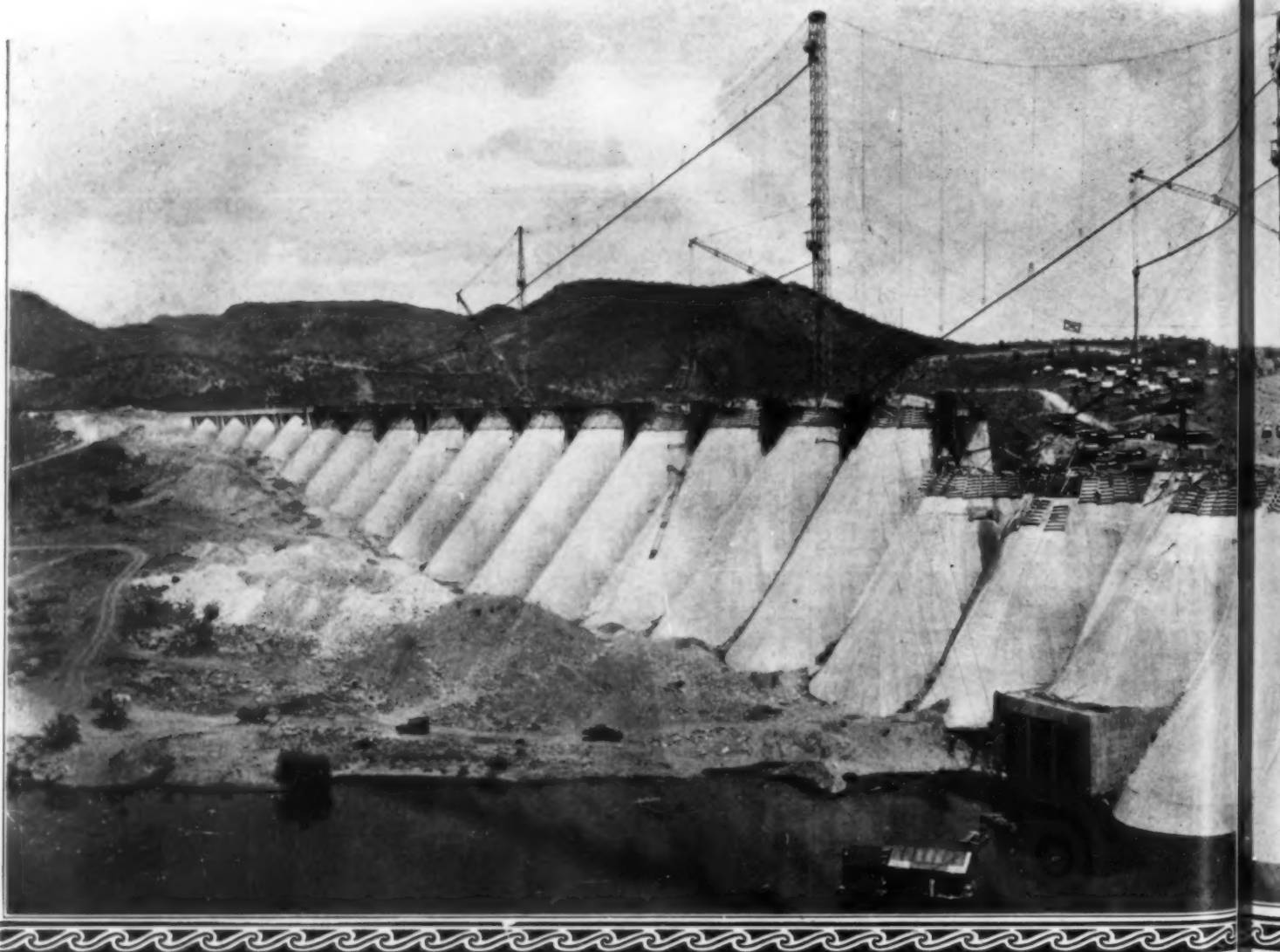
Bulletin 20-S gives
complete details on
Lakewood Mixers.

Two 28-S Lakewood Mixers mixed all the concrete for this dam, which upon completion, will be one of the largest multiple arch dams in the world. You will find Lakewood Mixers on large projects the world over.

THE LAKEWOOD ENGINEERING CO.

Construction and Paving Equipment

Cleveland, Ohio

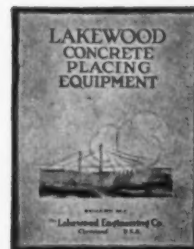


LAKEWOOD *Chute*

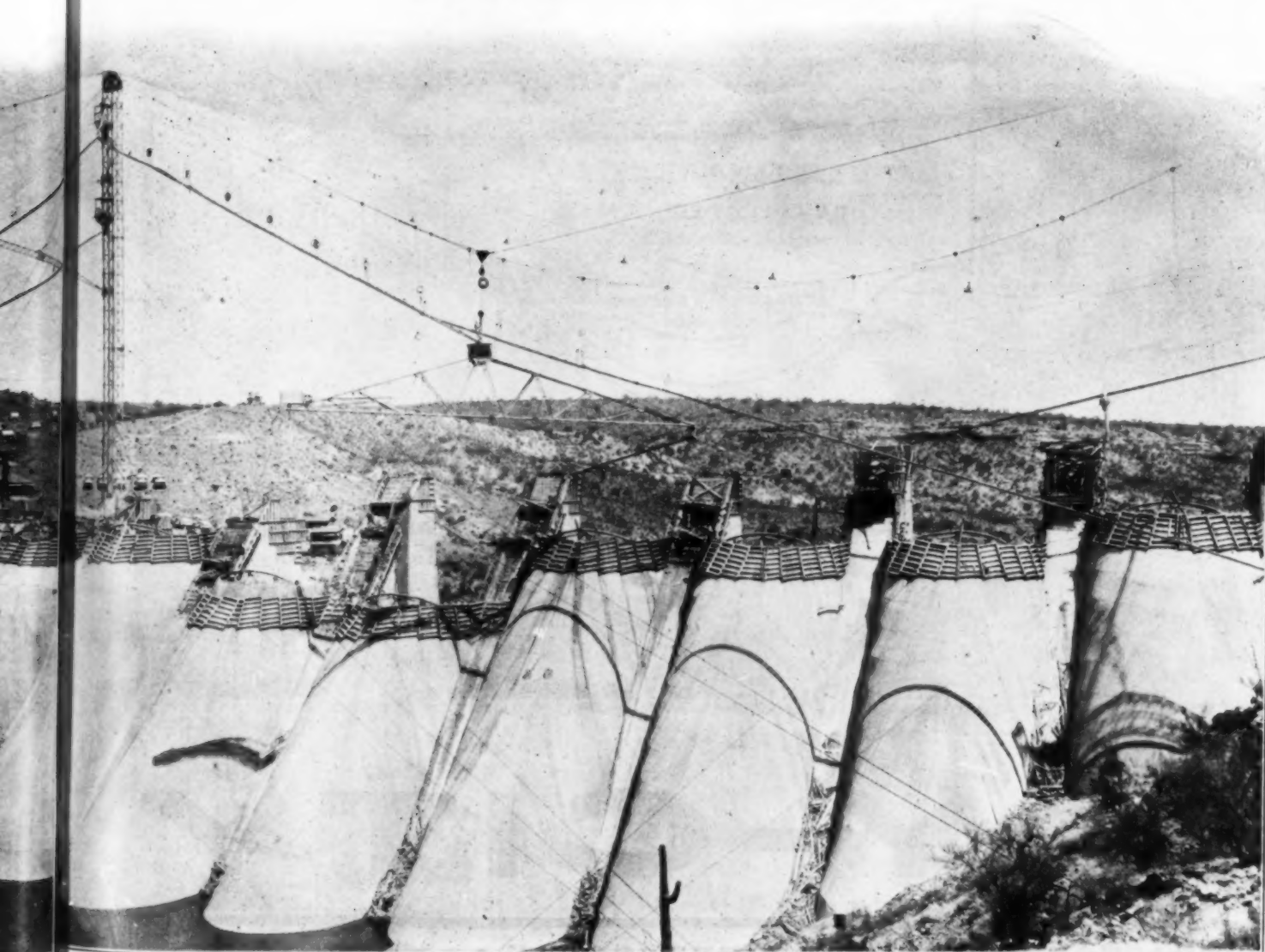
Placed the Concrete for The Lake Pleasant Dam,
near Phoenix, Arizona

Two 300 Foot Lakewood Steel Towers and Arch Band Chuting Equipment including four 75 foot counterweight sections, helped make possible the enviable record made on this job by Carl Pleasant, Engineering Contractor, and his organization.

THE LAKEWOOD ENGINEERING CO.
Construction and Paving Equipment
Cleveland, Ohio



Bulletin 23-S fully describes Lakewood Chuting Equipment.*





Visit our exhibit at the Road Show, Central Armory, Cleveland, Ohio, Jan. 9, 1928.

16B

Skimmers on hard shallow road cutting

Bottom picture shows the 16-B Convertible Excavator tearing up the bituminous macadam surface of North Avenue, Westfield, N. J. Tough, shallow digging.

Top picture shows the 16-B cutting a perfect grade in a shallow cut through a hard packed stone surface. The 16-B operates $\frac{3}{4}$ -yd. skimmer scoop, trench scoop, shovel, clamshell or dragline. Heavy crawlers, 14 ft. 8 in. long.

No machine on the market will earn bigger profits for the road contractor. Get all the facts about this heavy skimmer and you'll say so.

BAY CITY DREDGE WKS.

Bay City, Mich.



At the Road Show, the 16-B Skimmer and the Bay City Tractor Shovel, with both shovel and trench buckets, will be on exhibit.



BAY-CITY

TRACTOR SHOVELS

TRENCHERS

SKIMMERS



Ingersoll-Rand Portable Compressors and Rock Drills on a big road-building project.



Two "Jackhamer" Drills in operation



YOU CAN'T BEAT THIS COMBINATION

A "Jackhamer" feeds on hard rock and likes it. Rain or shine, fair weather or foul, there's no stopping this husky little drill. When a battery of these tools start working, the holes go down and go down fast.

The "Jackhamer" and its running mate, the I-R Portable Compressor, are a familiar combination wherever rock-drilling is done. In the old days a contractor needed a gang of men to drill the rock and open up a roadway. Nowadays, a pair of air drills, kept busy by the proper compressor, does more work than the old hand gang and does it at half the cost.

The beauty of it is that there are numerous types of "Jackhamers" and six different sizes of I-R Portables. This means that you can pick out the combination for *your* job, regardless of how large or how small it is. The right outfit will save you money and keep the job moving all day long.

Ingersoll-Rand engineers will gladly help you. Get in touch with our nearest Branch Office; literature and data will be sent on request.

Ingersoll-Rand Branch Offices are located at the following points in this country:

ATLANTA	DULUTH	PHILADELPHIA
BIRMINGHAM	EL PASO	PITTSBURGH
BOSTON	HARTFORD	POTTSVILLE
BUFFALO	JOPLIN	SAN FRANCISCO
BUTTE	KNOXVILLE	SALT LAKE CITY
CHICAGO	LOS ANGELES	SCRANTON
CLEVELAND	NEWARK	SEATTLE
DALLAS	NEW YORK	ST. LOUIS
DETROIT	NEW ORLEANS	ST. PAUL
DENVER		WASHINGTON

INGERSOLL-RAND COMPANY

11 Broadway New York City
Offices in principal cities the world over
 For Canada refer—Canadian Ingersoll-Rand Company
 10 Phillips Square, Montreal, Que.

Ingersoll-Rand

Visit our Booth (ES-3) at the Cleveland Road Show
 January 6th-13th

7 POINTS OF SUPERIORITY

1. Unit Construction. Engine and compressor are a compact, integral unit, mounted on one crankcase and driven by one crankshaft.

2. One-piece Drop-Forged Crankshaft, heat treated and accurately balanced, has six throws, four of conventional design for engine cylinders, and two 180 degrees apart and 90 degrees from the plane of the engine crank, for the air compressor cylinders.

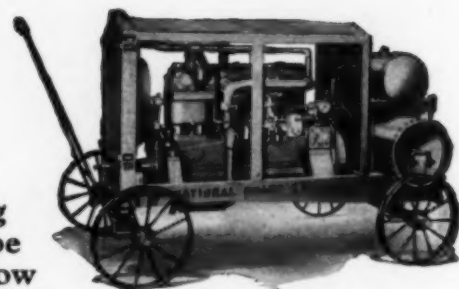
3. Dual-Cooling System assures maximum cooling efficiency. Modine Sectional Spirex Core Type Radiator, Fan and Centrifugal Water Pump. Flow of circulating water thermostatically controlled.

4. Engine Speed Limiting Control, consisting of engine speed idling control combined with automatic compressor unloading control, standard equipment.

5. Engine Speed Idling Control. Automatic pressure governor unseats compressor suction valves when predetermined maximum pressure has been attained, and automatic throttle control then slows down engine to a low, safe, economical idling speed.

6. Extreme Compactness and Sturdy Construction. 110 and 160 cubic feet capacity National Compressors can be mounted on Ford one-ton truck.

7. The Product of Air-Compressor Pioneers — 31 years' of specialization in designing and manufacturing air compressors for all types of industrial service.

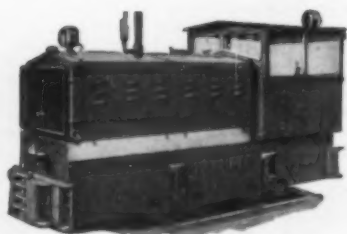


National Air Compressors are built in 110, 160, 240 and 330 Cu. Ft. sizes; standard mountings.

Exclusive territorial sales franchises available

NATIONAL BRAKE & ELECTRIC COMPANY
Division of Westinghouse Air Brake Co.
MILWAUKEE, WIS.

National
AIR COMPRESSORS
A WESTINGHOUSE PRODUCT



Milwaukee Gasoline Locomotives will solve your haulage problem. All sizes, all gauges. Pioneer builders of gasoline locomotives since 1907. Get acquainted with our Type "H" Models.

MILWAUKEE LOCOMOTIVE MFG. CO.
Subsidiary of National Brake & Electric Co.
MILWAUKEE WISCONSIN

MILWAUKEE
Gasoline Locomotives
Another Westinghouse Product

for
Speed!



Power!
Capacity!

LAMBERT CRANES

The Material Dealers
Have Discovered the
High Economic Value
of Lambert Cyclone
Cranes.

Some In Use Over 15
Years With Very Low
Maintenance Cost.

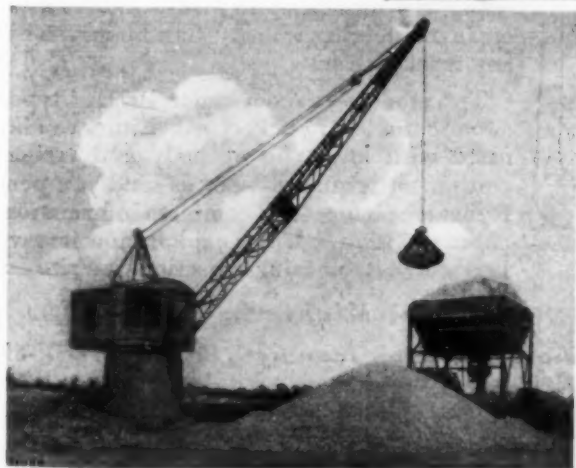
Cyclone Cranes Have
Long Booms and Han-
dle Big Buckets at
Long Effective Reach.



ROAD CONTRAC-
TORS, ASPHALT
PLANTS, MATERIAL
DEALERS AMONG
OUR CUSTOMERS

Their Problems Were
Solved with the Aid of
Our Engineers and
Their Faith in Lam-
bert Equipment.

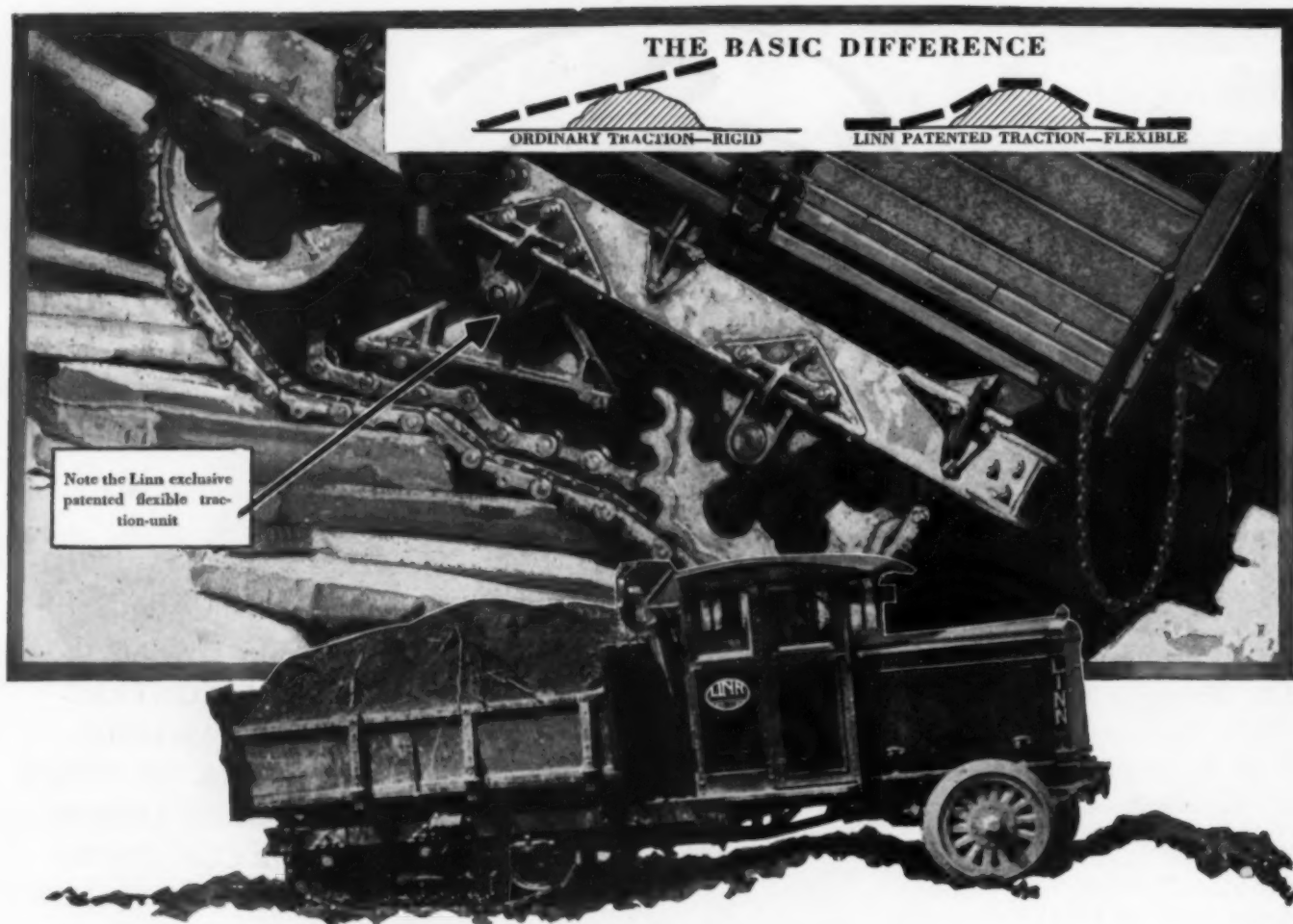
INVESTIGATE!



Designed
and
Built
By



LAMBERT HOISTING ENGINE COMPANY
117 POINIER ST. NEWARK, NEW JERSEY, U. S. A.

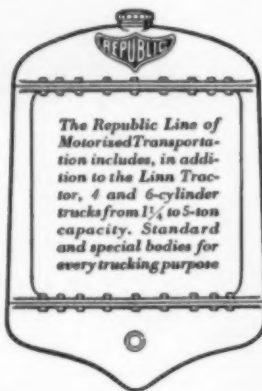


ONLY THE LINN *lays its own road as it carries pay load*

Whether the job consists of heavy hauling, road building, lumbering, construction, snow removal, oil or mining operations—the Linn Tractor brings remarkable advantages found in no other machine.

The Linn—and only the Linn—combines the pulling power of the tractor with the load-carrying features, ease of operation and safety of the heavy motor truck.

The Linn—and only the Linn—grips uneven surfaces, because of the Linn flexible traction unit, with its remarkable compensating device which cannot be duplicated.



Carrying its own pay load, the Linn will tow a whole train of loaded trailers. Conquers mud, snow, ice, rocks, difficult grades and passages, with utter safety. Operates with full power on sharp turns. Steers with ordinary steering wheel. Can be driven by any truck driver.

Two models—a six-cylinder, 100 H.P. type, a four-cylinder, 75 H.P. type. Either can be fitted with any type of body and trailer equipment required. Let us send you performance pictures and complete information about the Linn. Let us explain how its savings match its amazing operation. Write us.

REPUBLIC MOTOR TRUCK CO., INC., Alma, Michigan

See the Linn Republic Exhibit at the National Good Roads Show, Cleveland, January 9, Booth No. WW-89

Factories
Alma, Mich., and Morris, N. Y.

Factory Branches
New York: 32-37 Queens Blvd.,
Long Island City

Chicago	Los Angeles
Philadelphia	San Francisco
Detroit	St. Paul
St. Louis	Minneapolis
Baltimore	Portland, Ore.
Pittsburgh	Charlotte, N. C.

LINN

REPUBLIC

TRACTORS-TRUCKS

105 direct distributors
located throughout the
United States and 49
distributors located in
30 foreign countries

Canadian Linn Distributors:
Mussens, Ltd., Montreal



Heltzel Modern Equipment For Street and Road Building

IN the building of concrete roads and streets, modern conditions have brought drastic change of methods.

Equipment which served yesterday's needs do not fulfill the requirements of today and tomorrow for better paving at less cost.

In line with a policy of constantly keeping ahead of these fast moving events, The Heltzel Steel Form & Iron Company takes pride in announcing New HELTZEL Equipment for building longi-

tudinal and transverse expansion and contraction joints into city streets, a new joint pouring machine, a new HELTZEL Armor Plate Steel Road Form and important refinements in curb and curb and gutter forms, sidewalk forms, steel bins and grabbers and forms for all kinds of concrete construction.

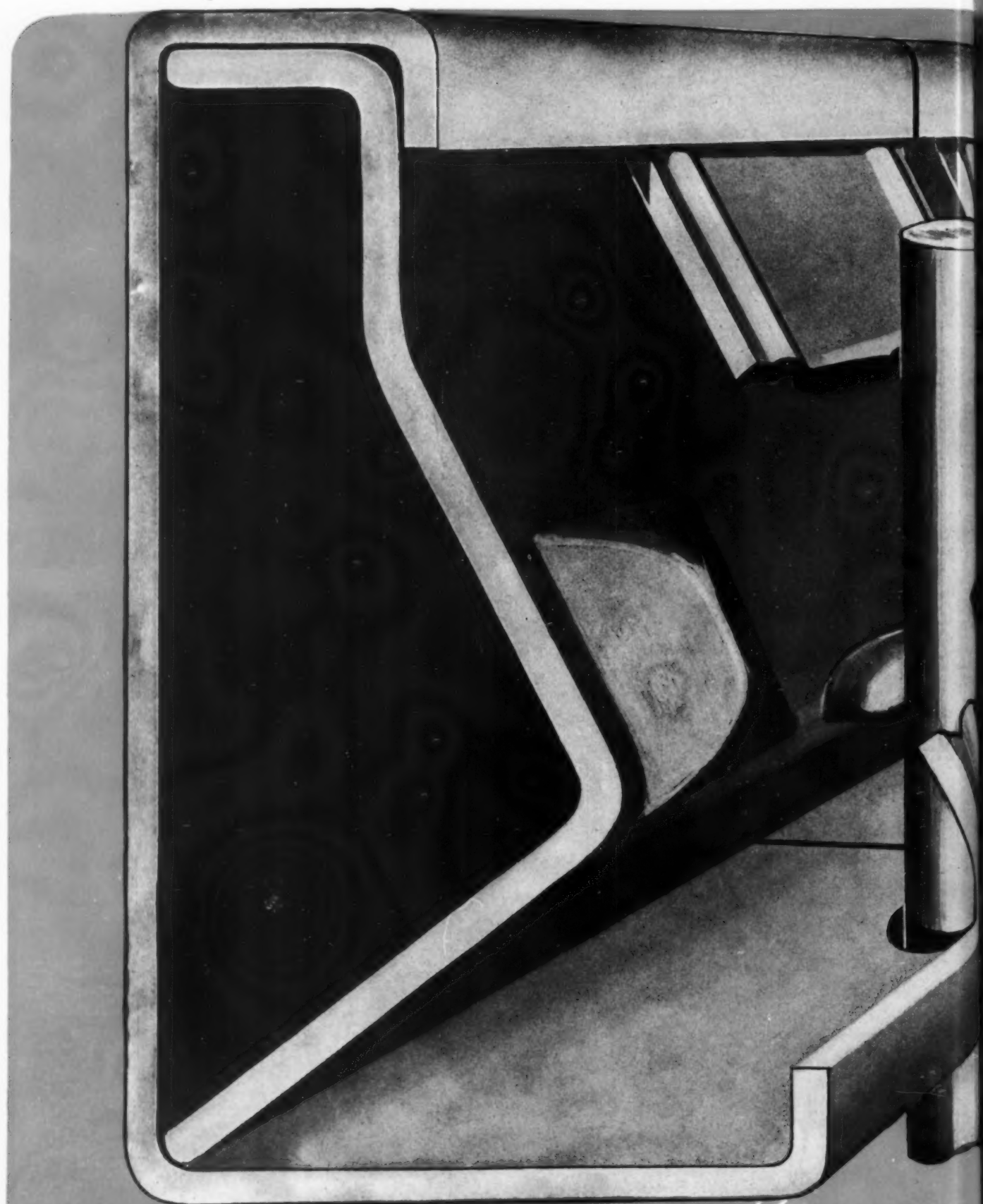
HELTZEL has brought unlooked for economies to all kinds of concrete construction.

THE HELTZEL STEEL FORM & IRON COMPANY, WARREN, OHIO
Export Office, Room 1332, 152 W. 42nd St., New York

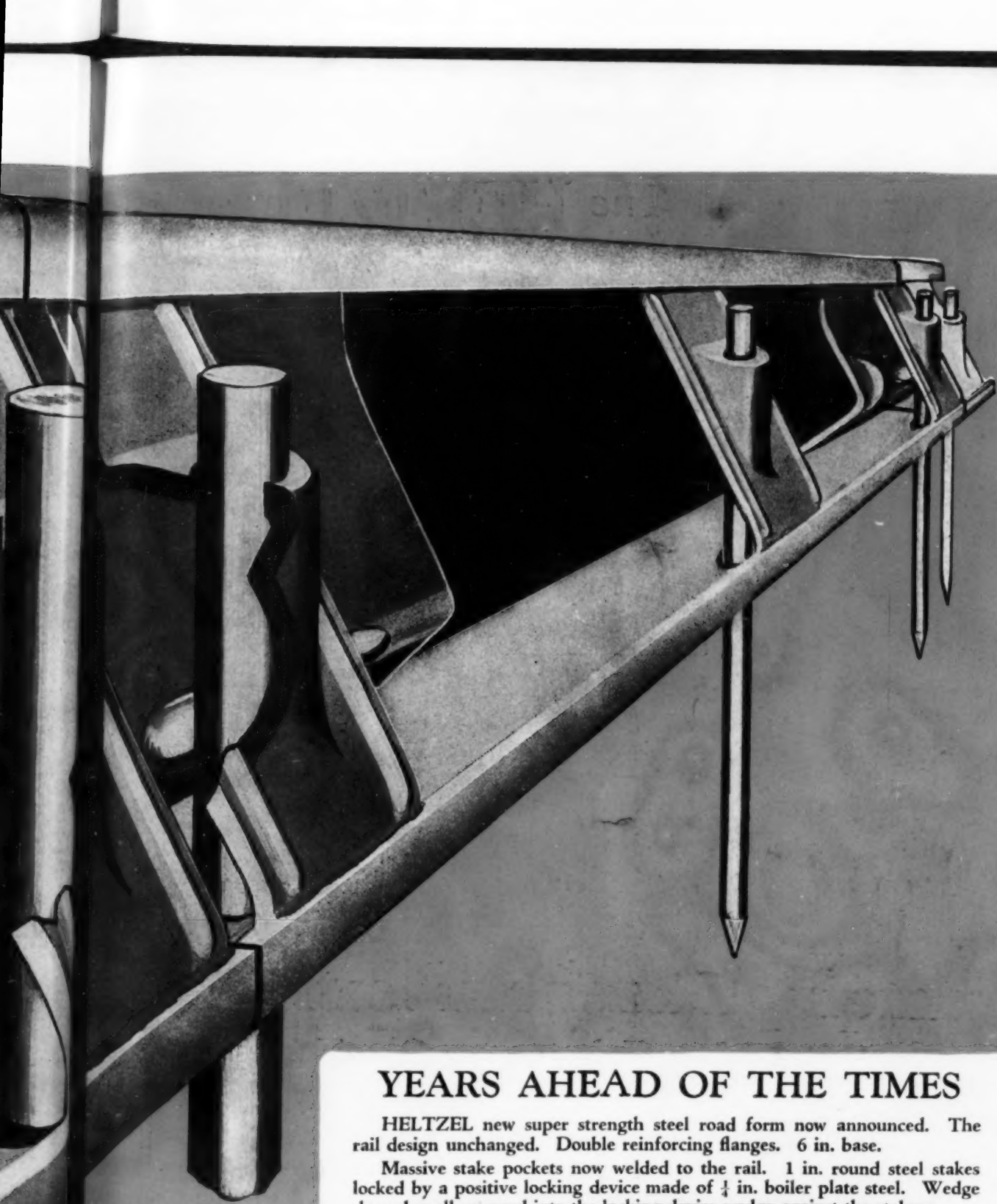
Cable Address "Oparo, N. Y." All codes used.

"See HELTZEL display at Booth AA 4 Auditorium, Cleveland, Ohio, Road Show, January 9th to 13th, 1928.

HELTZEL



HELTZEL "193



YEARS AHEAD OF THE TIMES

HELTZEL new super strength steel road form now announced. The rail design unchanged. Double reinforcing flanges. 6 in. base.

Massive stake pockets now welded to the rail. 1 in. round steel stakes locked by a positive locking device made of $\frac{1}{4}$ in. boiler plate steel. Wedge shaped swells pressed into the locking device wedge against the stakes.

A tap with your sledge not only locks the form but also aligns the rails. An easy tap with your sledge on the releasing lug unlocks the form and any section of rail can be removed without disturbing adjoining rails.

Here is that super strength and unequalled rigidity which provides for the future—a form which is years ahead of the times.

Write for HELTZEL'S new steel road form bulletin.

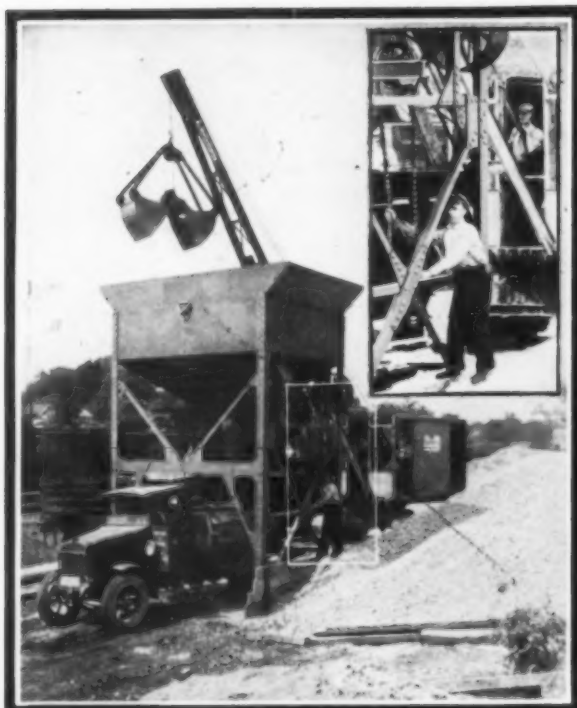
Patents and Patents Pending

THE HELTZEL STEEL FORM & IRON COMPANY, Warren, Ohio

30" "ARMOR PLATE" STEEL ROAD FORM

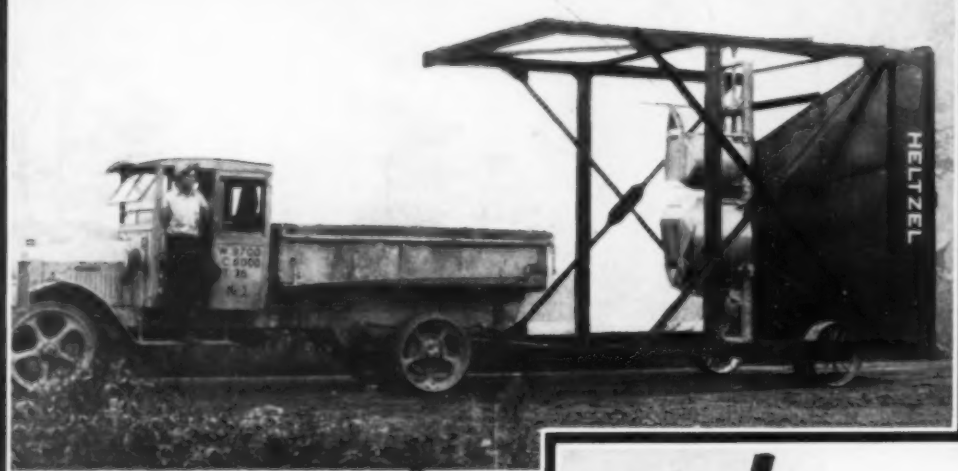
The HELTZEL Trailer Bin

Standard sizes 35, 55, 80 and 110 ton capacity grabatchers for measuring aggregate by volume or by weight.



Operation

HELTZEL grabatchers are operated by lever from the ground by control wheel from the bin platform or by chain wheel from the ground or from the platform. A complete batch of sand and stone every 10 seconds with a single operation.



Transportation

HELTZEL 35 and 55 ton bins are shipped or trailed in a single section. HELTZEL 80 and 110 ton bins are shipped or trailed in two sections.

Erection

Just hook on with your crane and up she goes. No loose parts. No diagram to follow. No danger to your workmen.

Stationary Bins

HELTZEL stationary bins are made in all types and sizes, round or square from 2 to 1,000 tons.

Write for HELTZEL'S new catalogue, of Material Handling Equipment.





Western 7-yard Crawler Dump Wagons in tandem on a 1,500 foot haul in sand where mules could work only with the greatest difficulty.

The Outstanding Achievement of 1927

There was no single piece of earth moving equipment produced in 1927 that has approached the success of Western 7-yard Crawler Dump Wagons. They have been purchased in great numbers by far-seeing contractors and already the ratio of repeat orders to initial orders is 2 to 3. Such instant and outstanding success can be due only to true worth.

You owe it to yourself to investigate the new Western 7-yard Crawler Dump Wagon

and learn of its cost-reducing possibilities. It will carry a 7-yard load over rough ground or sand—through mud, in fact any place a crawler tractor can operate. It will give greater speed and a 24-hour day. It will increase the number of working days by giving complete independence of weather and haulage conditions.



Western 7-yard Crawler Dump Wagon.

Bulletin 27-QSM will tell you how. Write today for a copy.

Western

Western Wheeled Scraper Company

Dump Cars and Grading Equipment

Aurora, Illinois, U. S. A.

Hercules

ENGINES

POWER for ditching—more power for hoisting and still more power to move around—but even these demands do not affect the flow of steady Hercules Power.

The most difficult jobs on the schedules are adding to the good name of Hercules Engines. Hercules Engines add to the good name of any Hercules powered equipment.

There is greatest rigidity in Hercules simplified design and precision manufacture. Rigidity means shock resistance—stamina—a power supply of greatest endurance.

Hercules power charts show more work per day, more days of service per year, and years and years of *extra* usefulness. The broad Hercules experience and the conscientious study of every commercial and industrial power need enables Hercules to apply the most enduring power for the greatest economy.

HERCULES MOTORS CORPORATION
CANTON, OHIO, U. S. A.

The ORTON

MODEL "V" DITCHER
TRAVELS AND WORKS BY
HERCULES POWER



HERCULES MODEL G — 4 $\frac{3}{4}$ " x 5 $\frac{3}{4}$ "
Furnishes ample power on the most economical basis

When the Bids were Opened— Jones was Low

AND they all said "Jones will go broke. He can't do it for the price." But Jones knew his business. He knew how to lay out a job and he knew it never paid to fit "on hand" equipment to a job. He knew the difference between a Wiley-Whirley, a derrick and a locomotive crane. And that knowledge not only enabled him to land the contract but made him a good profit on the job.

Jones knew that a Wiley-Whirley possessed all the advantages of a derrick and a locomotive crane without their limitations. Better than a derrick because it has a full swing, is easily and quickly moved and occupies less ground space. Better than a locomotive crane because of its greater stability, greater working radius and ability to handle bigger loads. And Jones knew that its extremely simple structural steel construction meant continuous operation and little expense for replacement parts.



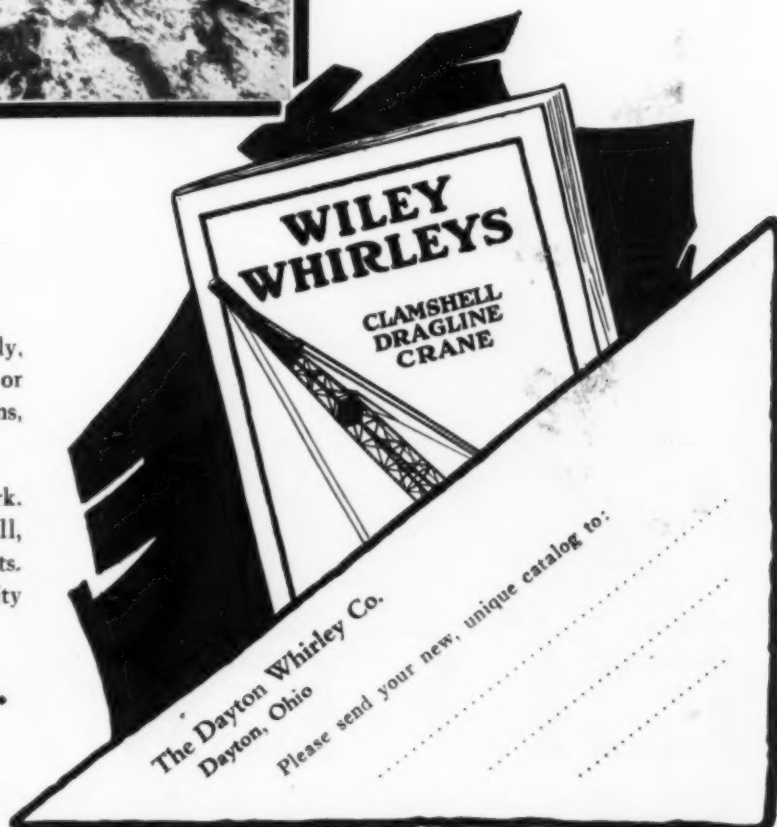
How often have you had that experience? How often have you seen a good job get away from you because you didn't know modern methods and equipment, and how often have you sacrificed a good profit rather than purchase equipment best adapted to the job?

Important Facts about the Wiley-Whirley

Since 1919 we have been building, exclusively, Wiley-Whirleys for clamshell, dragline, crane or derrick work, with 60, 75, 85 or 100-ft. booms, either with or without power.

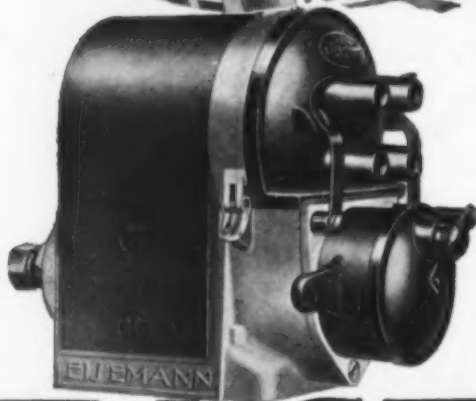
Not far from you there is a Wiley-Whirley at work. We will gladly tell you where. But first of all, send for a copy of our catalog and get the facts. There is nothing like a Wiley-Whirley in quality or price.

The Dayton Whirley Co.
DAYTON, OHIO, U. S. A.



LEACH Concrete Mixers

~ are Eisemann Equipped!



Leach multi-cylinder Mixers are equipped with an ignition system that meets every demand, every requirement.

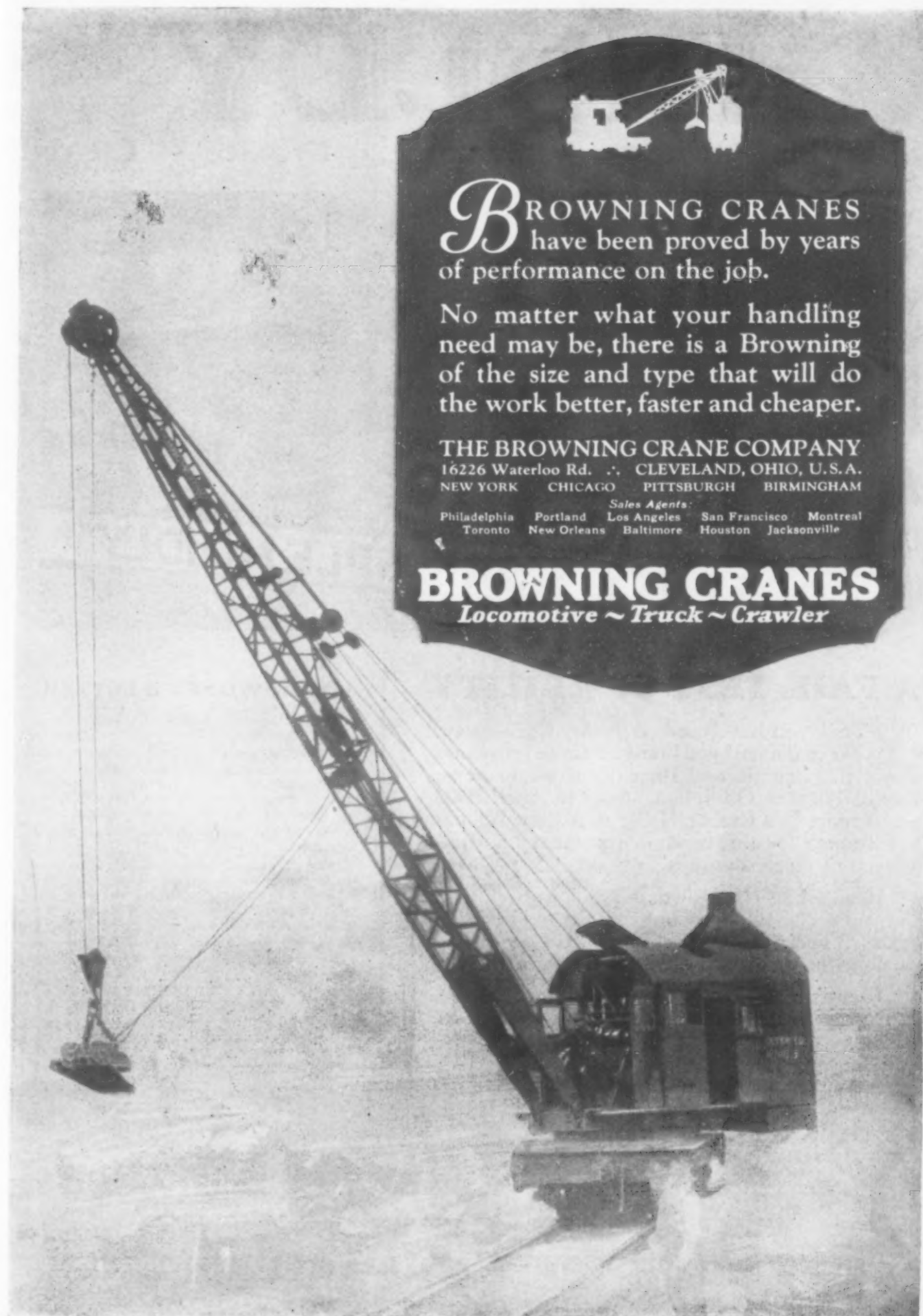
- A magneto that starts the engine with ease, even in the coldest weather.
- A magneto designed to operate in a cloud of fine dust, or a driving rain.
- A magneto built to function twenty-four hours a day, if necessary, without attention.
- A magneto that can be depended upon to keep the engine running as long as the gas holds out.


In short, a magneto capable of withstanding hard usage.

EISEMANN MAGNETO CORPORATION
165 Broadway - New York
DETROIT - SAN FRANCISCO - CHICAGO

EISEMANN

ELECTRICAL EQUIPMENT





BROWNING CRANES
have been proved by years
of performance on the job.

No matter what your handling
need may be, there is a Browning
of the size and type that will do
the work better, faster and cheaper.

THE BROWNING CRANE COMPANY
16226 Waterloo Rd. ./. CLEVELAND, OHIO, U.S.A.
NEW YORK CHICAGO PITTSBURGH BIRMINGHAM

Sales Agents:
Philadelphia Portland Los Angeles San Francisco Montreal
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BROWNING CRANES
Locomotive ~ Truck ~ Crawler

INSLEY

SHOVEL — Ditcher — Skimmer — Dragline — CRANE



A FAIR TEST OF ABILITY

AFTER you have used an Insley Excavator a year and a half you know all there is to know about it. Pringle and Buerkle, Road Contractors of Batavia, Ohio, bought one in April, 1926, and report in October, 1927, that they "cannot say enough for this piece of machinery and are very well pleased with it."

Read what Mr. Dowdney, their superintendent, thinks about it. Compare their work with yours. Their Insley has done whatever had to be done for them, and it will do the same for you.

It costs a road contractor more to be without an Insley Excavator than to own one.

MR. DOWDNEY'S LETTER

"Regarding our Insley Excavator purchased from Mr. Handman, in April, 1926.

"This Excavator has been in almost constant use (except December and January, winter 1926-1927) since the time of purchase and we are now making our first repair on it. Repairs have been almost nothing.

"As to the motor it has never had a single part replaced.

"We have used this shovel in all kinds of work, such as rock excavation, cuts and fills, gravel loading from creek beds and cellar digging and it does its work splendidly under all conditions.

"In fact we cannot say enough for this piece of machinery and are very well pleased with it.

Very truly yours,
PRINGLE AND BUERKLE,
Wm. Dowdney, Supt."



DITCHER



SKIMMER



DRAGLINE



CRANE

INSLEY MANUFACTURING
COMPANY - Indianapolis

600
**Engineers
and
Manufacturers**

IMPROVED! NEW!

Always wide awake to the ever changing needs of road building.

Continual improvements on Blaw-Knox Road Building Equipment are one of the reasons for its popularity and use on 90% of the paving jobs in the United States.

A good share of Blaw-Knox profits goes right back into development and research—a staff of competent engineers is constantly at work on up-to-the-minute improvements.

Blaw-Knox Company has done much to take the gamble out of road building and make the job easier for the contractor and engineer.

ROAD FORMS

All Blaw-Knox Road Forms will be 6" wide at the base. They will have an improved lock-joint for quicker setting and positive support for heavier machinery on soft subgrade.

The *everfast key* has been improved with a *shoulder* to take the releasing blow—cotter pins have been replaced by heavy bolts.

You will find Blaw-Knox Road Forms faster to set—stronger—and more reliable than ever.

INUNDATION for Road Building

Blaw-Knox has proven INUNDATION practical for central mixing. Blaw-Knox has also proven, beyond the shadow of a doubt, that INUNDATION is just as practical for road construction with central proportioning plants; no radical change in existing methods required. Eight plants are in operation in North Carolina, seven are working in Cuba—many others are in service in different localities.

INUNDATION is the only perfect mechanical system for making uniform strength concrete.

UNIVERSAL FORMS Remarkably Improved

Now equipped with the same famous staking system in use for so many years on Blaw-Knox Road Forms. Blaw-Knox Universal Forms can now be hung at will in any position at any grade and locked into position by the everfast key.

Decided improvements in the face forms and accessories (no loose pieces to be lost) make Blaw-Knox Forms better than ever for the construction of concrete curb, combined curb and gutter, integral base and curb, or sidewalk construction.

WEIGHING BATCHERS AND VOLUME BATCHERS

For measurement of aggregates by volume—or by weight—they are *automatic*. Improvements have been made which provide for quicker and more positive operation. Weighing Batches have been equipped with an auxiliary dial and baffles—aggregates and cement are measured accurately to the pound with great speed.

PORTABLE BATCHERPLANTS

Made in a complete range of sizes and types.

Absolutely self-cleaning—there can be no dead storage because of the steep sloping sides and wide bottom openings.

Absolutely Portable—the larger size Batcherplants are shipped in a few parts for quick and easy erection—the smaller sizes are shipped complete with folding legs and can be erected in a few minutes.

BUCKETS

Husky DREADNAUGHTS have been giving wonderful digging and re-handling service to contractors for years. Now—*sand sealed bearings* and *ball bearing sheaves* further prolong the life of this famous clamshell.

TURNTABLES

Now a complete range of sizes of these famous one man Turntables—to accommodate any sized truck from $\frac{3}{4}$ ton to 5 ton capacity. Extra wide ramps for the accommodation of dual tired trucks. Equipped with demountable wheels for transportation.

BATCH BOXES

Blaw-Knox Batch Boxes are made of $\frac{3}{8}$ " steel. Equipped with trunnion suspensions to increase speed of righting and dumping. 6" vertical range of adjustment makes it possible to take care of either 21E or 28E pavers.

BUILDINGS

Standard Steel Buildings for the housing of men, materials and equipment. These are fireproof and weatherproof structures which can be salvaged 100% when necessary to move them. Portable—but permanent.



BLAW-KNOX COMPANY
PITTSBURGH, PA.

Representatives in Principal Cities

BLAW-KNOX



SIZES

Pavers—7-E, 13-E, 27-E. Auxiliary equipment and choice of power to suit individual needs. Complies with A.G.C. Standards.

Construction Mixers—14-S, 21-S, 28-S. Steam, gasoline or electric power. Mounted on trucks or skids. Rubber tired wheels optional. 28-S on skids only. Complies with A.G.C. Standards.

Dandie Mixer—5-S, 7-S, 10-S—5-S single cylinder, 7-S, 10-S two or four cylinder gasoline engine. Power charging skip, or low charging hopper and platform. Rubber tired steel disc wheels or steel rimmed wheels. Complies with A.G.C. Standards.

KOEHRING COMPANY MILWAUKEE WISCONSIN

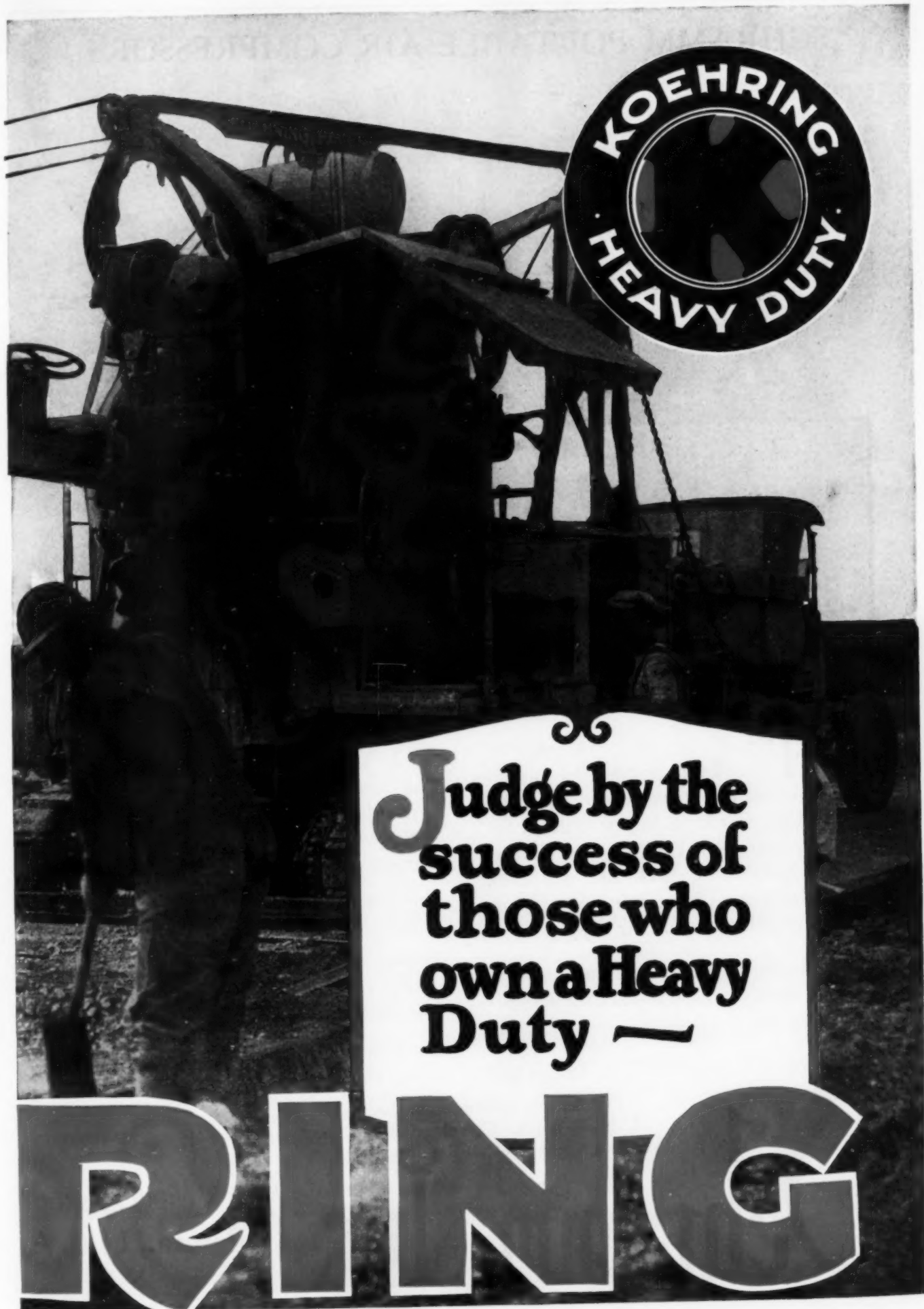
PAVERS, MIXERS—GASOLINE SHOVELS, CRANES AND DRAGLINES

Sales Offices and Service Warehouses in all principal cities

Foreign Dept., Room 1370, 50 Church St., New York City.

Mexico, F. S. Lapum, Cinco De Mayo 21, Mexico, D. F.

KOEHR

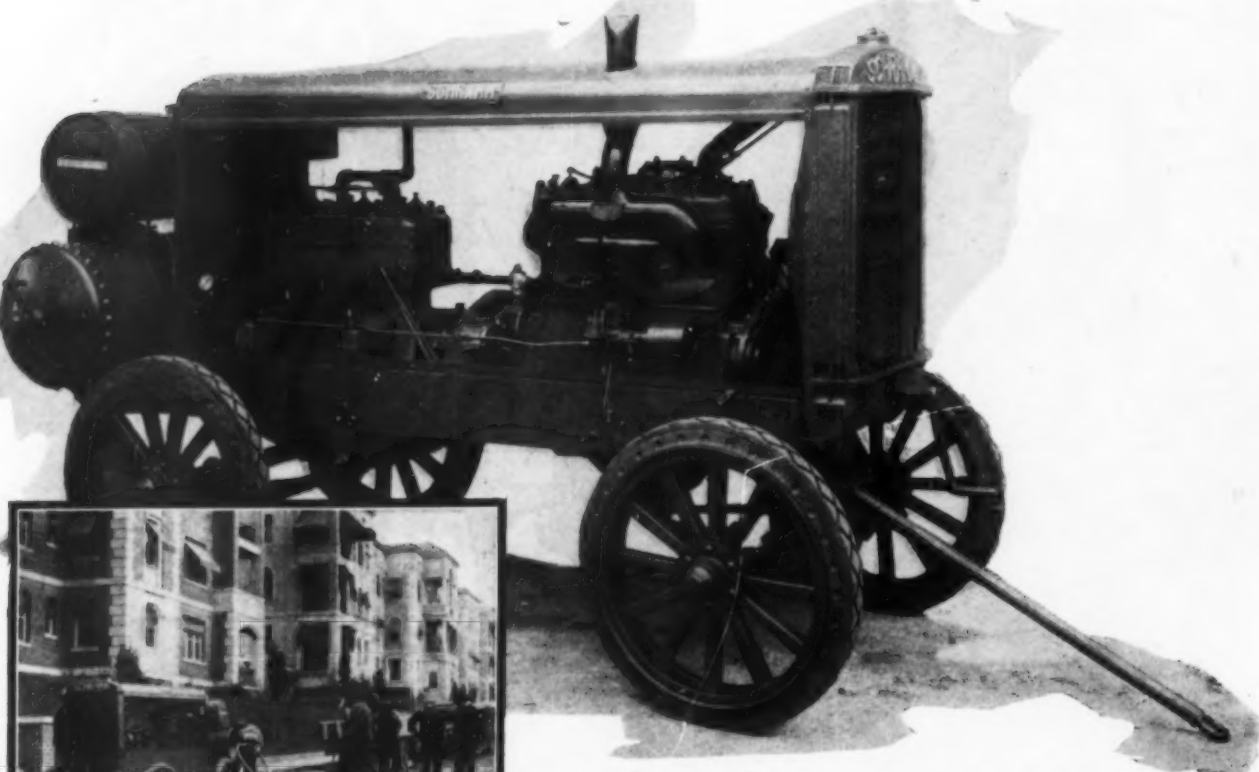


**KOEHRING
HEAVY DUTY**

**Judge by the
success of
those who
own a Heavy
Duty —**

RING

SCHRAMM PORTABLE AIR COMPRESSORS



*The City of Washington
depends on Schramm's*

THIS is an example of Schramm popularity in municipal maintenance and construction. For breaking pavement; for spading; for caulking pipe joints; for tamping back fill; for rock drilling—Schramm compressors furnish abundant air supply.

Some of the outstanding features found in Schramm Compressors include:

Capacities 60 — 120 — 180 — and

240 cubic feet displacements.

Powerful heavy duty Engines coupled to large capacity Schramm Compressors. (Also made with electric motor drive.)

Gasoline strainers to keep grit and dust out of carburetor.

Heavy duty, self-aligning clutch that permits starting engine independent of compressor.

Furnished with any type of mounting you prefer.

[See our exhibition at Booth
WW.14, Cleveland Road
Show week of January 9th]

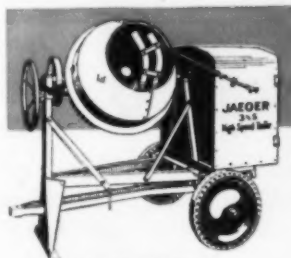
Schramm Inc.

West Chester
Penna., U. S. A.

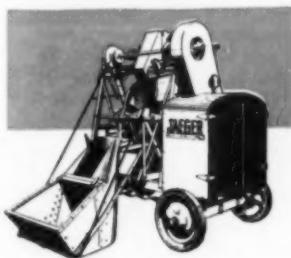
It's Yours. *Send for your copy TODAY!*

UNIVERSALLY USED FOR THORO MIXED CONCRETE

OK'd by over 75,000 users



TRAILERS
\$160 up, complete



TILTERS
3½-5-7-10-14 ft. sizes



NON-TILTERS
7-10-14-21-28 ft. sizes
Plaster-Motor Mixers
Placing Plants

JAEGER Announces

Lower prices on many sizes---
Timken Bearings--- Automatic
Skip Shaker (No Pounding) (More Batches) and many
other features for 1928!

Write for Catalog, Prices and Convenient Terms

THE JAEGER MACHINE COMPANY

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BRANCHES AND SERVICE IN OVER 100 CITIES

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Jaeger Machine Co., Columbus, Ohio
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Please send catalog, prices and terms on
☐ NON-TILT MIXERS ☐ PLASTER MIXER ☐ TILTING MIXERS

Name _____ Date _____
Address _____
City _____ State _____

DEPENDABILITY and PERMANENCE • • The True Measure of Quality in Portland Cement



FIFTEEN years ago the New York Central Railroad, insuring—as always—safety, service, and long life, chose Atlas Portland Cement for the Grand Central Terminal and Electric Zone in New York City. ¶ Again in 1924 for the Castleton Cut-Off Bridge over the Hudson, termed by its president “one of the engineering marvels of the age,” the New York Central specified Atlas. ¶ Thus, by repeated choice did this vast engineering organization approve the enduring satisfaction and permanent dependability of Atlas Portland Cement. ¶ Contractors the country over, whose good-will depends as much upon good materials as upon their own good

work, are in ever enlarging numbers recognizing enduring satisfaction and permanent dependability as the real measure of quality in portland cement. The natural result is that they are more and more suggesting and specifying Atlas —“The standard by which all other makes are measured.”

Atlas is the nationally known cement, made so by its quality, and by many years of consistent national advertising. In the past two years alone, more than 60,000,000 copies of Atlas advertising were distributed. Practically every prospective builder will again be reached by Atlas advertising in 1928. You will find that your customers know and approve Atlas, as soon as the question of cements is discussed. The Atlas Portland Cement Company, 25 Broadway, New York.

ATLAS PORTLAND CEMENT GRAY & WHITE

Main Offices: New York • St. Louis

NEW YORK • ST. LOUIS • CHICAGO • BIRMINGHAM • KANSAS CITY • PHILADELPHIA • BOSTON • DES MOINES • OMAHA • ALBANY • JACKSONVILLE, FLA.

In the Castleton Cut-Off (above), built in 1924, there were used 195,000 barrels of Atlas, every one of which met all the tests of the New York Central engineers. Eleven years earlier, in 1913, Atlas was also used in the New York Central Terminal (at right). Both are monuments to the dependability and permanence of Atlas.



A vastly enlarged range of artistic possibilities is given to concrete by Atlas WHITE, perfected by The Atlas Portland Cement Company. A true portland cement, it has all the famed qualities of Atlas GRAY Portland Cement—high tensile strength, permanence, economy. In addition, it invites architects to plan varieties of color, to choose from unlimited and widely varied surface textures, to specify even decorative sculpture of concrete.



Hinsey & Dull, Indiana Road Contractors, moved 500 yards a day with this five-scraper outfit of Baker Maney 1 1/4 yard scrapers with only three men.

BAKER Earth Moving Equipment Moves More Dirt Per Man

Big-capacity, quick-loading, short-turning, easily handled Baker Maney Self-Loading Scrapers give you more results for your dollar and more yards per man. Put them behind your big tractors and watch what three men and often only two men will do.

If You Are a Contractor—You will appreciate what it means to move 500 yards or more today with only three men. Compare this with a big gang of men and all the expense connected with their supervision. Even single units are used by leading contractors for leveling off sub-grade, doing the job better and cheaper.

If You Are a Road Official—You will find that one or two Baker Maney scrapers carried along with your grader outfit can clean up the odd earth-moving jobs as you come to them. Besides you can use full trains for the big jobs and always at a saving over any similar equipment.

Baker Maney Scrapers are made in two sizes—Model D, 1 1/4 yd. and Model H, 3/4 yd. Use coupon below to get full information and prices.

**See Baker Equipment
at Road Show**

Cleveland—Jan. 6th to 13th, 1928
Space WW-17

BAKER MANEY
Self Loading Scrapers

The Baker Mfg. Co.
568 Stanford Ave., Springfield, Ill.

For quick results on the short hauls, Baker One Man Automatic Rotary Scrapers are what you want. They are called "the fastest-operating scrapers." They are much stronger and heavier than any similar one-man scrapers. Full-revolving—easily handled—automatic loading which eliminates stops—no backing up to dump. Operation is continuous greatly increasing the yardage.

Made in 4-ft., 5-ft., 6-ft. and 7-ft. widths for operation with any large or small tractor. Use the coupon below to get full details.



Loading a Baker One Man Rotary Scraper.

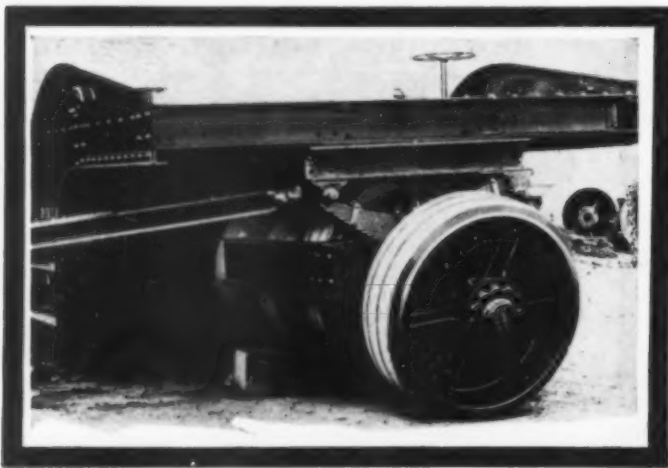
BAKER ONE-MAN
AUTOMATIC
Tractor Rotary Scrapers

☐ Baker Maney Scrapers. ☐ Baker Rotary Scrapers.
Please send literature on items checked above, to:

Name..... Model of Tractor Used
Address.....

Let's

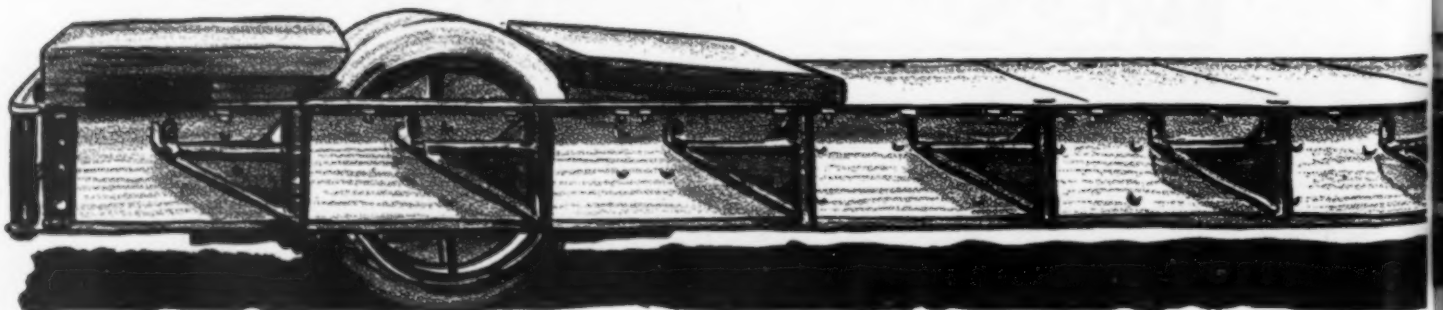
Note 90 radius for short turns, a feature of the ROGERS 6 and 8 wheel type trailers. These trailers are spring mounted front, with full fifth wheel. Observe manner in which center two wheels are raised. Illustrating ability to meet road contour.



ROGERS ADVANTAGES

1. Trailers are Rogers built in capacities from 1 to 60 tons. Heavier trailers built to order.
2. Rogers Trailers can be built to load from side or rear.
3. Rogers Trailers can be equipped with cast steel side swinging brackets which allow the platform to be extended 1 ft. on each side to carry extra wide loads. When not needed brackets can be folded in flush with outside frame members, and securely locked in position as shown below.
4. Rogers Trailers have four rear wheels on two rocking axles which are free to oscillate to fit contour of the road. In the 8-wheel trailer this feature applies to both front and rear wheels, thereby giving the tires their full bearing value on the pavement at all times.

Detailed specifications of any Rogers Trailer sent upon request. Write, wire or 'phone



Go!

A Rogers Runs on Any Highway

That's the beauty of Rogers Heavy Duty Gooseneck Trailers. They're easy to maneuver on any highway, carry weights up to sixty tons quickly, easily without injury to loads or roads. That's because Rogers doesn't exceed the allowable load per wheel.

They take hard usage, they're built for it. Because Rogers Trailers are

easy to load and easy to haul they knock hours off moving time. All of which means they operate at a cost surprisingly low.

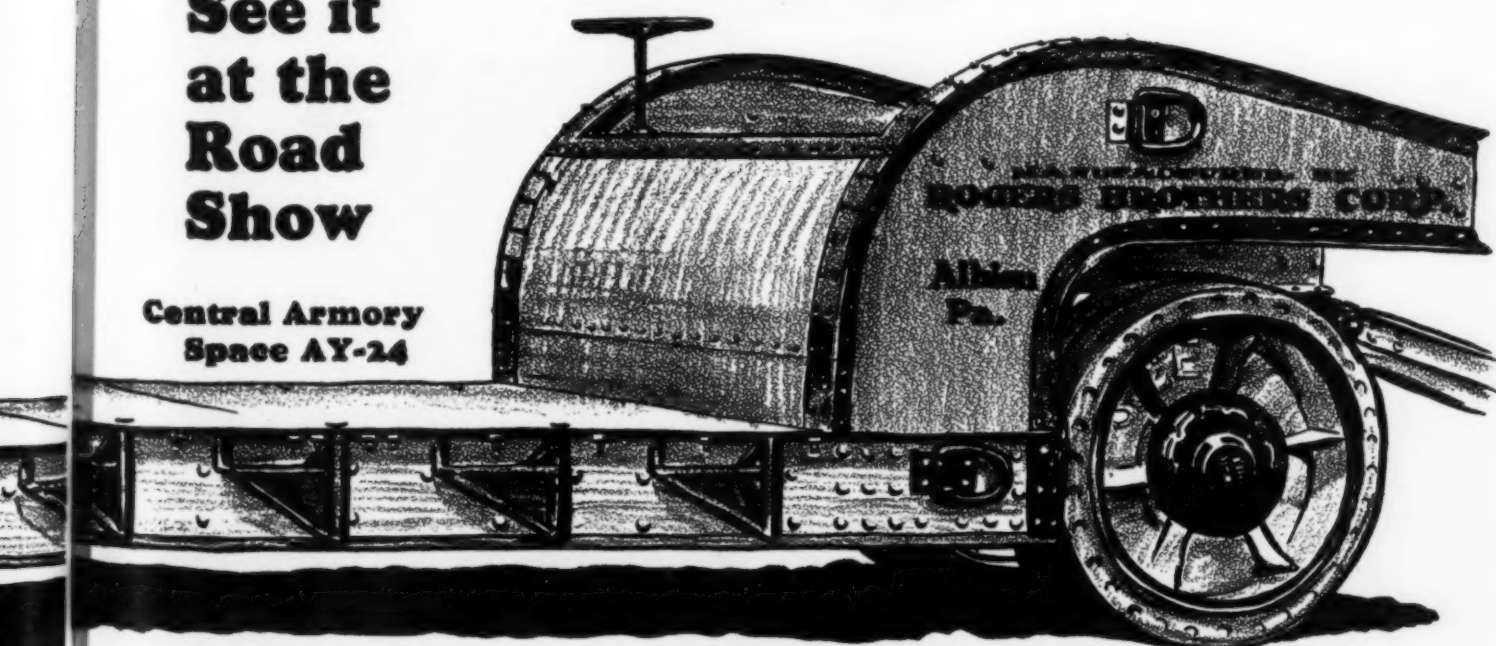
Built to meet your individual requirements in four, six and eight wheel types, capacities from one ton and up.

Rogers are outstanding among heavy duty trailers. Ask about them.

ROGERS BROTHERS CORPORATION
Albion, Penna.

**See it
at the
Road
Show**

**Central Armory
Space AY-24**



BUTLER BINS

For Every Road Building Need

CONTRACTORS are using Butler Bins and Hoppers to speed up work and cut road building costs. The equipment has proved itself dependable and speedy in operation. There are practically no maintenance charges. Bins and hoppers last through many years of hard service and are changed from one location to another in the shortest time, at the least expense.

At the Road Show be sure you examine Butler Bins and Hoppers carefully. Learn their important advantages. Talk to contractors who are using them. There is a story of cost reduction and time saving that you should know.

*Valuable Information For You at
Booth WW42—Road Show*



The Curtis Portable Compressor saves the cost of a special operator



1. Saves Labor

Where a trailer type compressor outfit is used, it has become common practice to put a non-producing man on the payroll to attend the compressor. This man's wages in a single season may amount to the price of the outfit. This entire expense can be eliminated with a Curtis portable compressor.

The Fordson provides power

both for moving and operating the compressor. Any tool operator can drive it when necessary. No special attention is required, since the compressor is automatically cooled and lubricated. Speed and pressure are controlled by suitable governors. Fuel and water tanks are ample for a full day's operation, and Fordson service is available everywhere.

2. Saves Time

The Curtis unit saves the time involved in shoving or dragging the ordinary compressor about. On work which constantly moves forward, as along a road or street,

the Curtis is kept always within hose length of the work, thus eliminating the time, expense and inefficiency of ever lengthening air lines.

3. Saves Fuel

Long air lines greatly reduce the delivered volume of air, while power cost remains the same. Thus the elimination of long air lines by means of a Curtis results in much lower fuel cost per unit of air delivered. Fuel is

further saved through having only one engine to operate; and frequently the difference in cost of kerosene as against gasoline proves to be a third considerable saving. Lessened fuel cost alone will often pay for the Curtis unit.

4. Saves Investment

The complete Curtis unit with Fordson costs less than other portable units of similar capacity. If you already have a Fordson,

your additional investment is cut down still further. When the compressor is not in use, the Fordson can be detached and

utilized for many other purposes, so that even its small cost should be divided over many jobs.

Mail the coupon and let us send you actual figures on cost savings in many kinds of work. They will surprise you.

	Portable Compressor, both operated and moved by Fordson.
	Model "A" Air Compressors. Full self-oiling. Water cooled. Up to 50 H. P.
	Style "V" Two-Stage Compressor. Air-Cooled. 1/4 to 2 H. P.
	Air Hoists, Cranes, Trolleys. Fast, economical, speed up production.
	Paint Spray Compressor. Hand unloader (By - Pass for starting.)
	Compressed Air Car Wash System. A complete cleaning service.
	Hydraulic Car Washer, 1 H. P.; 2 H. P.; 2 H. P. over-size.
	Rotating Auto Lift, Oil-Locked. Absolute control and safety.
	Air Stands. Reel type or tower type. Easy to operate. F1

Check items in which interested,

Gentlemen:—Please send me full details on the Curtis Portable Compressor, your proposition and prices.

Name

Address

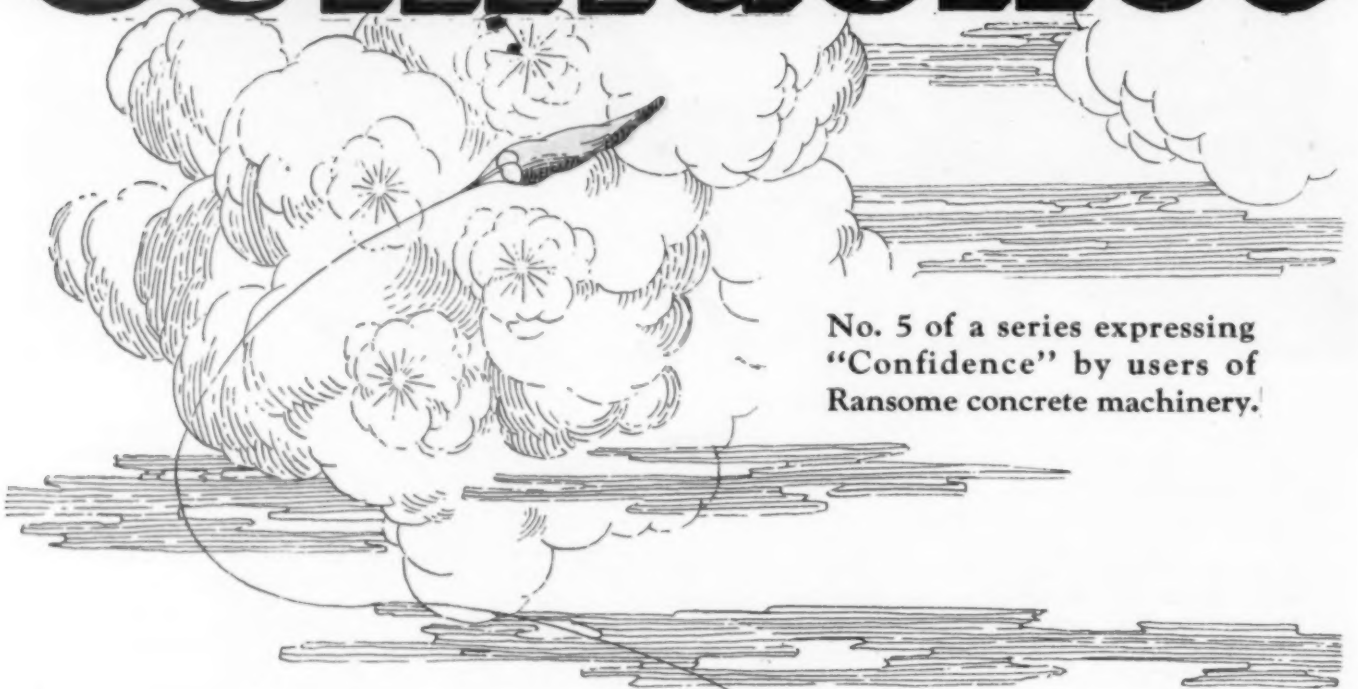
..... Have you a Fordson?

Curtis
Pneumatic Machinery Company
St. Louis
Seventy-Fourth Year

1931 Kienlen Ave., St. Louis

518-I Hudson Terminal, New York

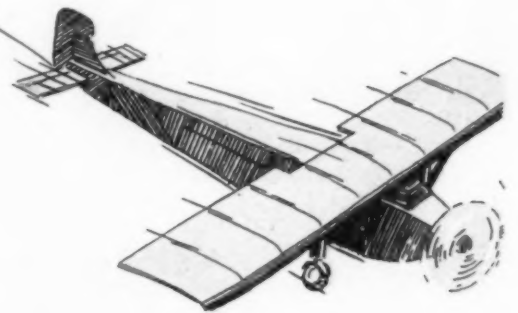
Confidence



No. 5 of a series expressing
"Confidence" by users of
Ransome concrete machinery.

THE aviator who tows a target must have implicit confidence in the ability of the artillerymen and their guns to shoot straight—and shoot at the right time.

Over 95% of the owners of a Ransome 27-E Master Paver have shown their confidence in Ransome by purchasing another Ransome paver when in the market. Some have even purchased a third and a fourth Ransome!



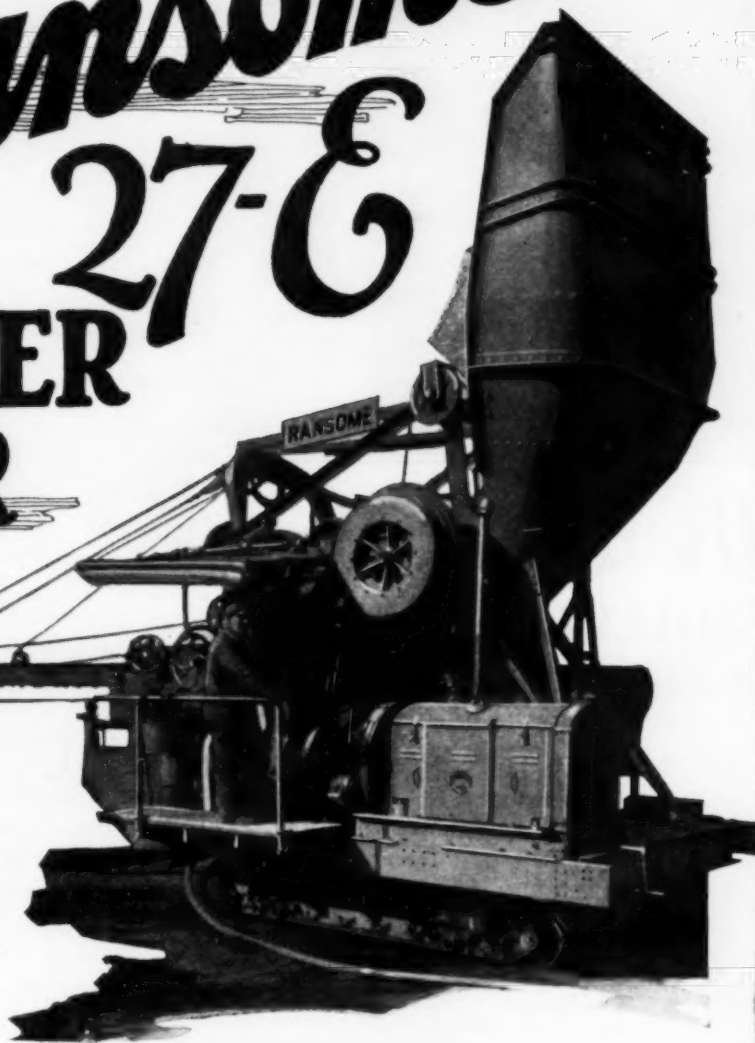
Confidence

Ransome

27-E

MASTER PAVER

See our exhibit
Booth 99, West Wing
at the
Cleveland Road Show



A few large users — from Coast to Coast

Peter Mitchell, Inc., Greenwich, Conn.
Union Paving Co., Philadelphia, Pa.
F. A. Canuso & Sons, Philadelphia, Pa.
Booth & Flynn Co., Pittsburgh, Pa.
Dunn & Ryan Contracting Co., P'tsb'gh, Pa.
White Paving Co., Chicago, Ill.
Ready & Callahan, Chicago, Ill.

Julius Porath & Son, Detroit, Mich.
J. A. Mercier Co., Detroit, Mich.
R. D. Baker Co., Detroit, Mich.
McKechnie-Peirce Co., Toledo, Ohio
Winston & Company, Kingston, N. Y.
Silas B. Mason Co., New York City
H. & P. Construction Co., Los Angeles, Cal.

RANSOME DOMESTIC REPRESENTATIVES

ALBANY, N. Y.
Sager-Spuck Supply Co., F. &
ASHVILLE, N. C.
North State Culvert &
Machinery Co.
ASTATULA, FLA.
Preston Machinery Co.
ATLANTA, GA.
Henry G. Williams
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BALTIMORE, MD.
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Equipment Co.
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Giles & Ransome
PITTSBURGH, PA.
Ransome Machinery Co.
PORTLAND, OREGON
McCracken-Ripley Co.
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Brandt Iron Works
SEATTLE, WASH.
Star Machinery Co.
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Clare Osborn, Ltd.
VANCOUVER, B. C.
N. B. C. Equipment Co.



Ransome Concrete Machinery Company

1850 — Service for 78 Years — 1928

Dunellen

New Jersey



Hardly a Ripple!

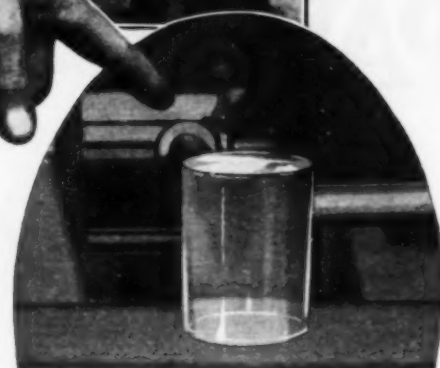
SULLIVAN

"Vibrationless" Compressors
are here

Vibrationless operation of your portable compressor means trouble-free service. It means dependable air power, freedom from delays, and protection for your profits—to say nothing of long life for your compressor.

And now in the portable compressor, as in the high grade automobile, vibration has been reduced to almost zero.

The picture shows a stock Sullivan 310-ft. capacity portable, running at full speed. A glass of water filled to the brim is standing on the frame. The wheels are not blocked, and the compressor is not braced in any way. Yet the surface of the water barely ripples, and not a drop is spilled.

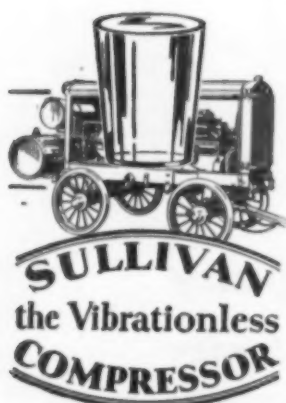


Full Speed, 800 R.P.M. but not
a Drop Spills. The Water
Test Shows One Reason
for the Superiority
of the Sullivan
Compressor

There are reasons why Sullivan Portable Compressors are vibrationless. Send for Catalog 7283-F.

Sullivan Portable Compressors, Rotators, Busters, Spaders, Hoist and a Portable Drill Sharpener will be on display at the Road Show, Cleveland, January 9th to 13th.

SULLIVAN MACHINERY COMPANY, 168 S. Michigan Ave., Chicago



S U L L I V A N

Sullivan Contractors' equipment is stocked and sold by Leading Distributors in the following cities:—

Albany	Charleston	Detroit	Kansas City	New Orleans	Seattle	Wallace
Atlanta	Chattanooga	Globe	Knoxville	Oklahoma City	St. Paul	Waco
Baker, Ore.	Cincinnati	Grand Rapids	Little Rock	Pittsburg, Kan.	Shamokin	Youngstown
Barre	Columbus	Hartford	Los Angeles	Pittsburgh	Shenandoah, Pa.	Edmondson
Birmingham	Dallas	Huntington	Louisville	Portland, Me.	Syracuse	Moncton, New
Bluefield, W. Va.	Davenport	Houston	Miami	Portland, Ore.	Tampa	Brunswick
Boston	Dayton	Indianapolis	Milwaukee	Providence	Toledo	Ottawa, Ont.
Buffalo	Denver	Jacksonville	Nashville	Raleigh	Tucson	Winnipeg
	Des Moines	Joplin		Rochester	Waco	

SULLIVAN SALES OFFICES IN THE UNITED STATES

Birmingham, Ala.; Boston, Mass.; Butte, Mont.; Claremont, N. H.; Cleveland, Ohio; Dallas, Texas; Denver, Colo.; Duluth, Minn.; El Paso, Texas; Huntington, W. Va.; Joplin, Mo.; Knoxville, Tenn.; Los Angeles, Calif.; Muskogee, Okla.; New York; Pittsburgh, Pa.; Pottsville, Pa.; Salt Lake City, Utah; San Francisco, Calif.; Scranton, Pa.; Spokane, Wash.; St. Louis, Mo.; Terre Haute, Ind.



Boost

your profits with a "pair of jacks"

Contractors increase business and earnings through this new ARMCO method of culvert installation.

From Nebraska, Oklahoma, Texas, New York, and from New England, come reports of quick and satisfactory culvert installations by the Armco jacking method. On each job the officials in charge saved time and money and increased the safety of their work. On each, there was a handsome profit for the contractor.

isting embankment. The jacking method had never before been used in New England, although it had been used quite extensively by railroads, highways and public utilities in other parts of the country. Because this method avoided the disadvantages mentioned in the preceding paragraph, and because it appeared to be straight-forward and simple, it was adopted.

Opportunities like these exist in every state. Wherever openings are required under existing embankments—for new culverts, for conduits, for undercrossings, for cattle passes—there is also a profit awaiting the live contractor.

Literally, in addition to your ordinary tools, all the equipment needed is a pair of sturdy jacks. Small investment, small crew—quick turn-over, satisfactory return. If you are interested in the Armco jacking method as a profitable side line or as an exclusive specialty, write us for practical working data not available from any other source.

[[SEE US AT THE ROAD
SHOW—BOOTH EH-41]]

Forty manufacturing plants throughout the United States and Canada assure you immediate service on drainage requirements, no matter where you may be.

**ARMCO CULVERT MANUFACTURERS' ASSOCIATION
MIDDLETOWN, OHIO**

ARMCO CULVERTS

Predominant in use—because predominant in quality

©1928, Armco Culvert Mfrs' Assn., Middletown, Ohio

CONSTRUCTION METHODS—January, 1928

Page Eighty-nine

Welcome to —the Home

At Public Hall

CLEVELAND

January 9-13

the Best Road

Show ever held

— in America's finest Exposition
Building



EVERYTHING is in readiness — for a successful convention, a great exhibition and a whale of a good time. When Cleveland asked for the 25th Annual Convention and Good Roads Show she made you some big promises. And Cleveland is fully prepared to deliver *more* than she promised. For five big days Cleveland's magnificent new Public Auditorium will house the greatest exhibit of road-building, road-maintenance and contractor's equipment ever assembled under one roof — a great World's Fair of the Highway Industry.

Come to Cleveland — January 9th to 13th, inclusive — for five big days of pleasure and profit.



The Cleveland Tractor Co.
Cleveland, Ohio

Cleveland of CLETRAC

YOU'LL find CLETRAC at the Road Show, of course — with a complete line of CLETRAC Crawler Tractors. But please don't make your visit to our booth your only Cletrac call. This is your *special invitation* to visit the CLETRAC factory out on Euclid Ave. Cleveland is the home of Cletrac Crawler Tractors — and we will be "at home" to the entire road-building fraternity throughout the convention.

See the big show at the Public Auditorium by all means — but don't fail to visit the CLETRAC Display at the factory. We have made big preparations for your visit. There will be a complete Road-Building Exhibit — an exposition in which many other manufacturers of contractor and road-building machinery will take part.

Free transportation to and from the factory in DeLuxe Busses — free lunch all day long, every day — trips through the plant — field demonstrations — we have **EVERYTHING** to make your visit interesting, profitable and highly enjoyable. Special invitation to the ladies.

Please call at Cletrac Booth at the Show for your Guest Card!

At Cletrac Factory

CLEVELAND

January 9 - 13

"Open House" for Everybody
Interested in Road Building

Special Demonstrations
Special Entertainment

Free Transportation Free Lunch



The Cleveland Tractor Co.
Cleveland, Ohio



Proper distribution of weight is an important factor to investigate when you buy clamshell buckets.

More than half the weight of an Owen is located in its center shaft. This "live weight," completely utilized when closing, delivers greater digging power equally to both jaws and enables the bucket to dig at sharp angles without toppling over. In addition, it directly counteracts the lifting tendency exerted by the upward pull of the closing line.

Such concentration of weight, low in the construction where it belongs, is one of the chief reasons why Owens Get a Mouthful at Every Bite. There are 16 other reasons why Owen Buckets are guaranteed against breakage and have longer life. An Owen folder tells the whole story. Send for it.

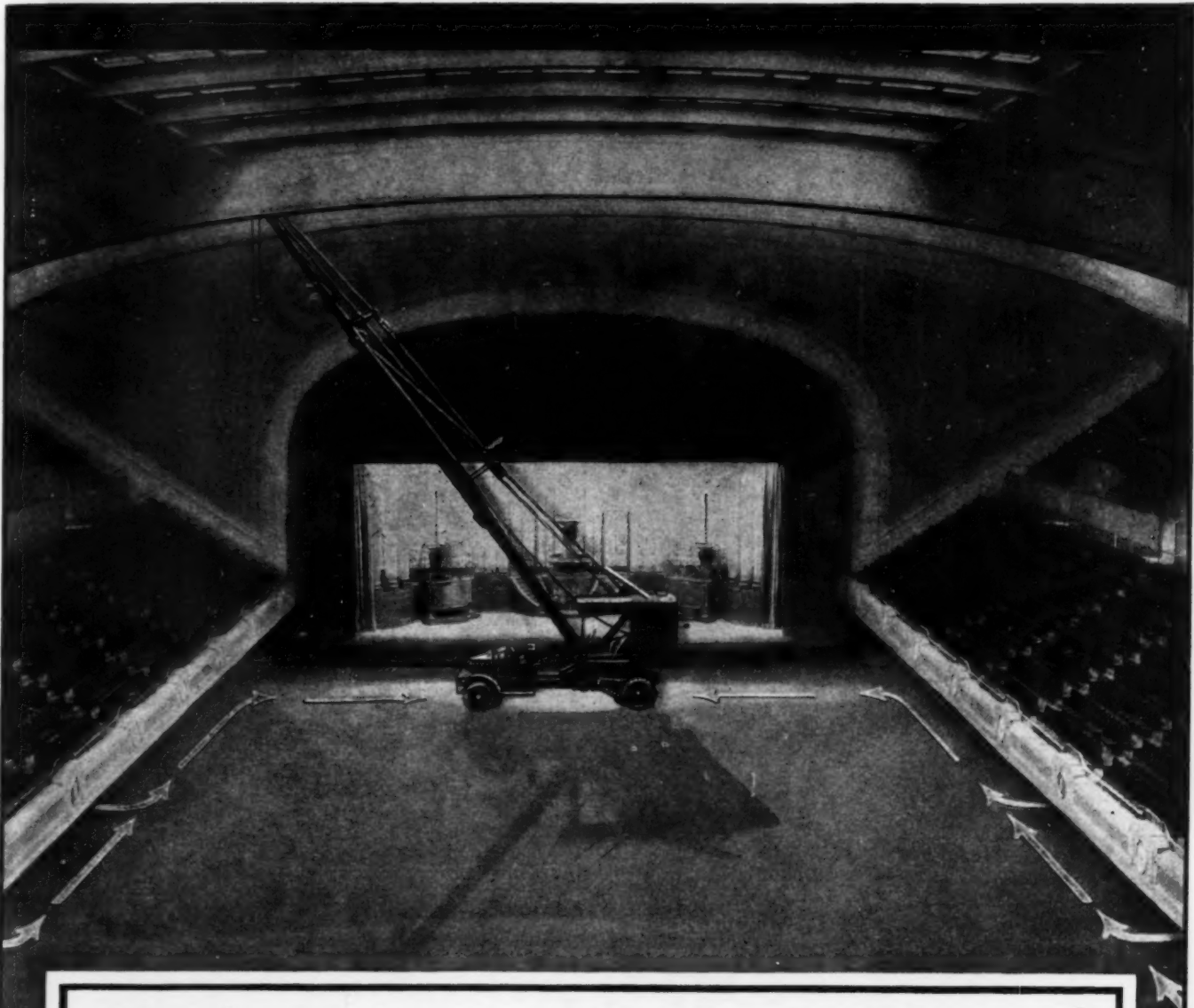
THE OWEN BUCKET CO.

6023 BREAKWATER AVE. • CLEVELAND, OHIO



See the Owen Exhibit at
the Road Show, Jan.
9-13, 1928, at Cleveland

Owen Buckets



Here's the home of the 1928 Road Show!

Motor Truck Crawler's First Road Show

Be sure to visit the Universal Crane booth to inspect the motor truck crawler, the combination 8 wheel truck and high speed crawler, used for cranes exclusively on Universals.

If you cannot attend the Cleveland Road Show write today for Bulletin 936 describing the new developments Universal will exhibit.

Cleveland's \$9,000,000 Public Auditorium, the largest hall of its type in the United States, will house the 1928 Road Show.

Prominently spotted, just where you see it on the picture, will be the exhibit of Universal Motor Truck Mounted Cranes. When you come in look for the long, golden yellow boom—and follow it.

It leads to Space AA-10 right in front of the stage, where you'll find Universal Cranes and the latest truck crane developments.

The UNIVERSAL CRANE Co.

919 SWETLAND BLDG.

--

CLEVELAND, OHIO

UNIVERSAL CRANES



Costs Less— With Clevelands

Five men and Cleveland C6 Paving Breakers will break up more pavement, hard roads, frozen ground, dig more man-holes, enlarge more trenches than fifty hand laborers—and do it at less cost.

They're easier to work with—men like them, do more work. And compared with hand methods Clevelands save 75% of the time and 50% of the cost on practically any job.

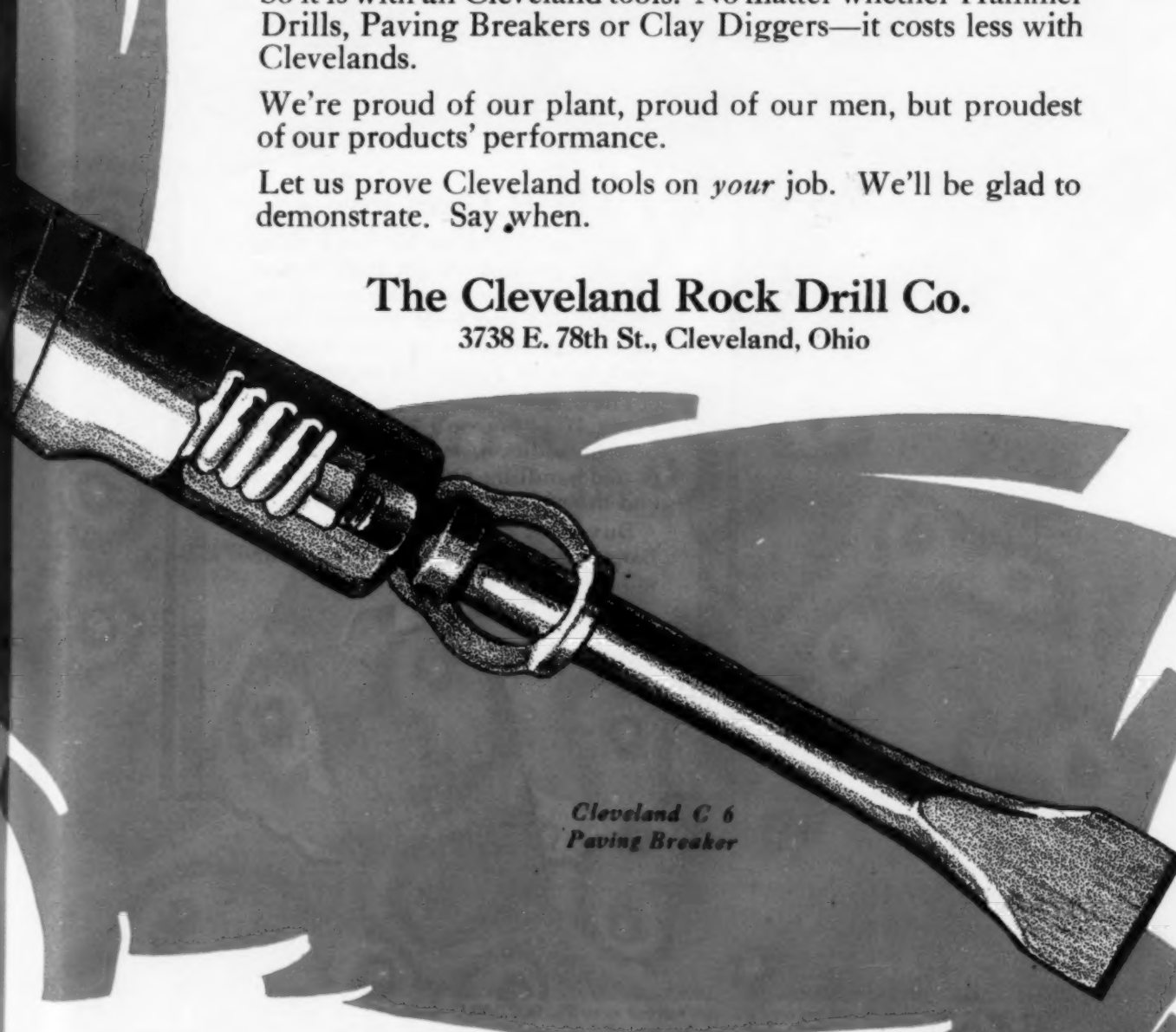
So it is with all Cleveland tools. No matter whether Hammer Drills, Paving Breakers or Clay Diggers—it costs less with Clevelands.

We're proud of our plant, proud of our men, but proudest of our products' performance.

Let us prove Cleveland tools on *your* job. We'll be glad to demonstrate. Say when.

The Cleveland Rock Drill Co.

3738 E. 78th St., Cleveland, Ohio



Cleveland C 6
Paving Breaker

BATES *Multi-Wall* PAPER BAGS



John H. Green says—

“ON conduit work we have been doing for the South Park Board, we have bought all our cement in Bates Multi-Wall Paper Bags. We find 5-ply paper bags are better in this kind of work because they resist moisture.”

The 5 stout separate walls of Bates Paper Bags not only resist moisture but, in addition, stand up under repeated handling, empty out clean, and end the nuisance of bag returns!

Buy your cement and plaster in Bates Multi-Wall Bags and so put yourself on a no-loss basis.

BATES
VALVE
BAG
CORP.,
Chicago,
Illinois

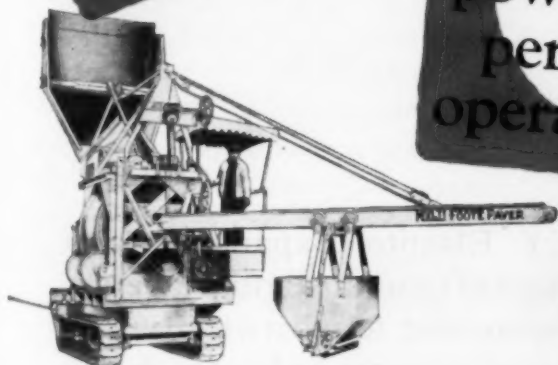


Working in exposed locations on Chicago's great new \$52,000,000 Outer Drive, John H. Green, Contractor, protects himself from loss by buying all his cement in Bates Multi-Wall Paper Bags

**60
HORSE
POWER**



**6
CYLINDERS**
power enough to
perform every
operation at once



The Foote Company, Inc.
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that
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what other paver can offer as much?

Prominent engineers use

CAREY ELASTITE EXPANSION JOINT

freely in construction work

because:

—it absorbs over-stresses due to expansion and contraction and prevents unsightly cracks in concrete work.

—common labor can install it easily. There is no loss, no waste, no breakage.

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—it will stand an astonishing amount of abuse and still remain serviceable.

CAREY Elastite Expansion Joint consists of two substantial layers of asphalt-saturated felt, between which is interposed a heavy body of asphaltic compound, the whole being inseparably bonded together in sandwich form by mechanical pressure. Made in preformed strips, in widths, lengths, and thicknesses as desired. Write for full particulars.

THE PHILIP CAREY COMPANY
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EXPANSION JOINT

Driving 80 ft. sheeting
in 79 ft. leads

Hammer and Leads both

McKiernan-Terry

This 14-in.x $\frac{1}{2}$ -in. arch web steel sheeting was driven parallel with, and at right angles to, the concrete approach to the D. L. & W. High Level Bridge over the Hackensack River, to prevent movement of soil. We made the special 79-ft. leads (supported by a 45-ft. boom on a caterpillar steam crane), and we furnished the 9B-2 Hammer that drove the sheeting to grade. Just ask H. F. Curtis, the contractor, his good opinion of McKiernan-Terry Hammers and the service behind them.

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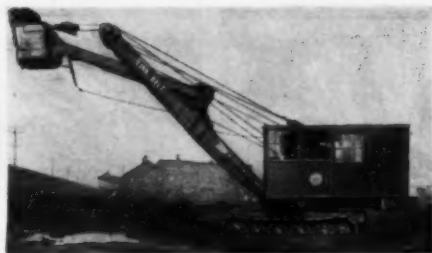
Prevent Concrete Failures by Making Tests of Your Concrete and Concrete Aggregates.

Frequent compression tests are not only now required on all large contracts, but are absolutely essential from a standpoint of safety.

The illustration shows one of our 100-ton hydraulic presses arranged especially to test concrete test cubes, cement, stone, etc.

When it is desired to check and calibrate the gauge load readings, a variable pressure accumulator (of known increments) is furnished.

Write for Bulletin B-18X.



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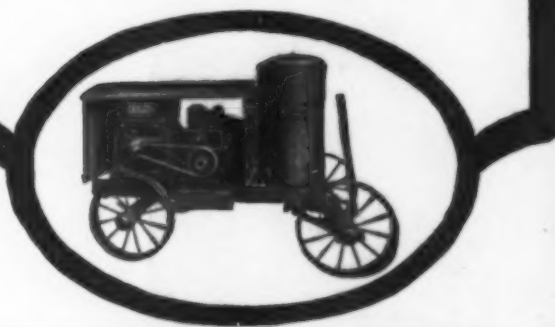
Buhl

AIR COMPRESSORS

Below is illustrated the BUHL Type C Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

There are six sizes of portable air compressors in the BUHL line to choose from. For operating jack hammers, riveters, clay spades, concrete breakers, etc. The BUHL gives dependable air power at low cost—send for bulletins today.

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Manufacturers
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Moved and Operated by a Single Power Plant

This complete Acme Self-propelled crushing plant is moved to the stone source by the same tractor power plant that crushes stone.

A single shift of the clutch and the entire plant is at the job—on the job.

Write for details. Service warehouses in all principal cities.

Acme Road Machinery Company
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Forty-eight pages of construction costs covering a period of 17 years have been compiled by *Engineering News-Record*. Here you have in convenient form the high-low-average prices of basic materials and rates paid labor in a number of centers.

Also, there are index numbers, and complete tabulations of actual prices bid on 50 different jobs in 1926.

All for one dollar **\$1**

A. W. WELCH,
CONSTRUCTION METHODS

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Please send me.....copies of CONSTRUCTION COSTS for which I enclose \$.....

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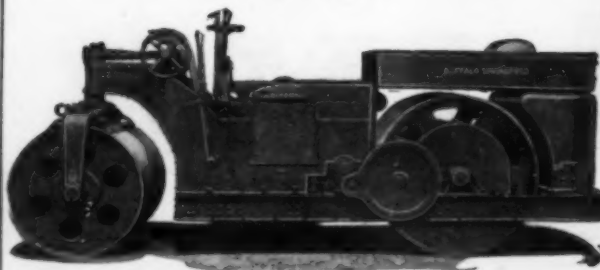
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When the Nameplate reads Buffalo-Springfield

you are in the presence of the Dean of all road rollers, the oldest well known make, also the most popular—proven by the fact that more American roads and streets have been built with Buffalo-Springfields than with all other makes combined.

Literature illustrating latest models ready to mail.

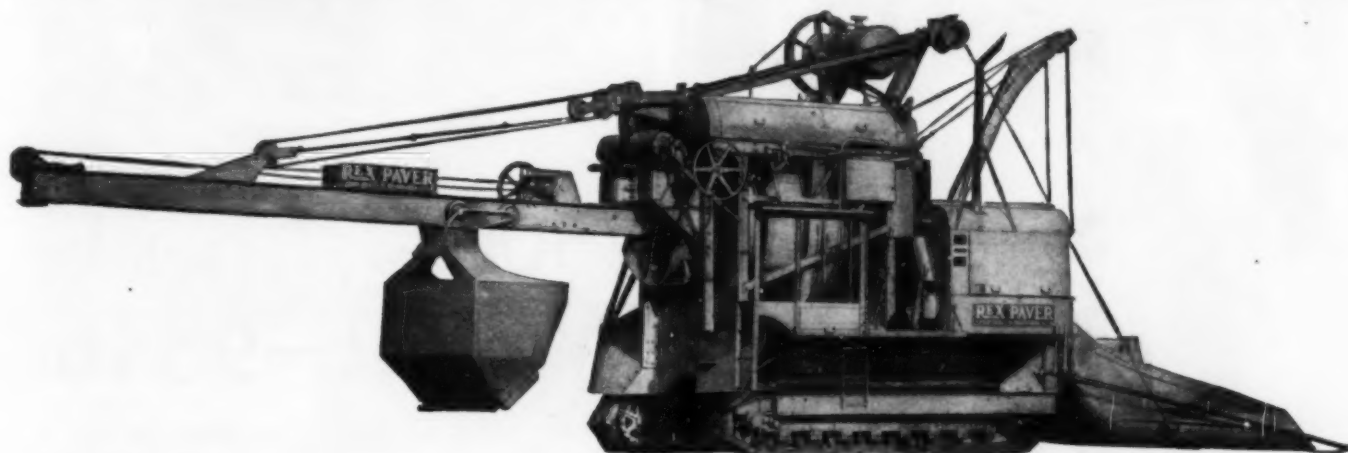
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The Finest,
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Two Greatest Paver Improvements

*Since the Advent of the
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THIS year the fast operations that make Rex speed are put on an automatically maintained high-speed schedule—by the New Rex Mechanical Man (optional equipment).

The paver operator touches one lever and the charging water control, and discharging operations are performed automatically—without wasting a split second.

Forty more mixing minutes are given the paver drum each day.

And with The Mechanical Man is the micrometer controlled Rex high-speed water—that meets the strictest water specifications of '28 and years to come.

More than ever, the Rex 27-E is the Finest, Fastest Paver ever Built.

6 Operations Automatically

The Mechanical Man, at the touch of a lever, raises the skip, opens the discharge, closes the discharge, opens the water, shuts off the water, locks the skip in charging position. And all functions are overlapped to provide the greatest speed possible in any paver.

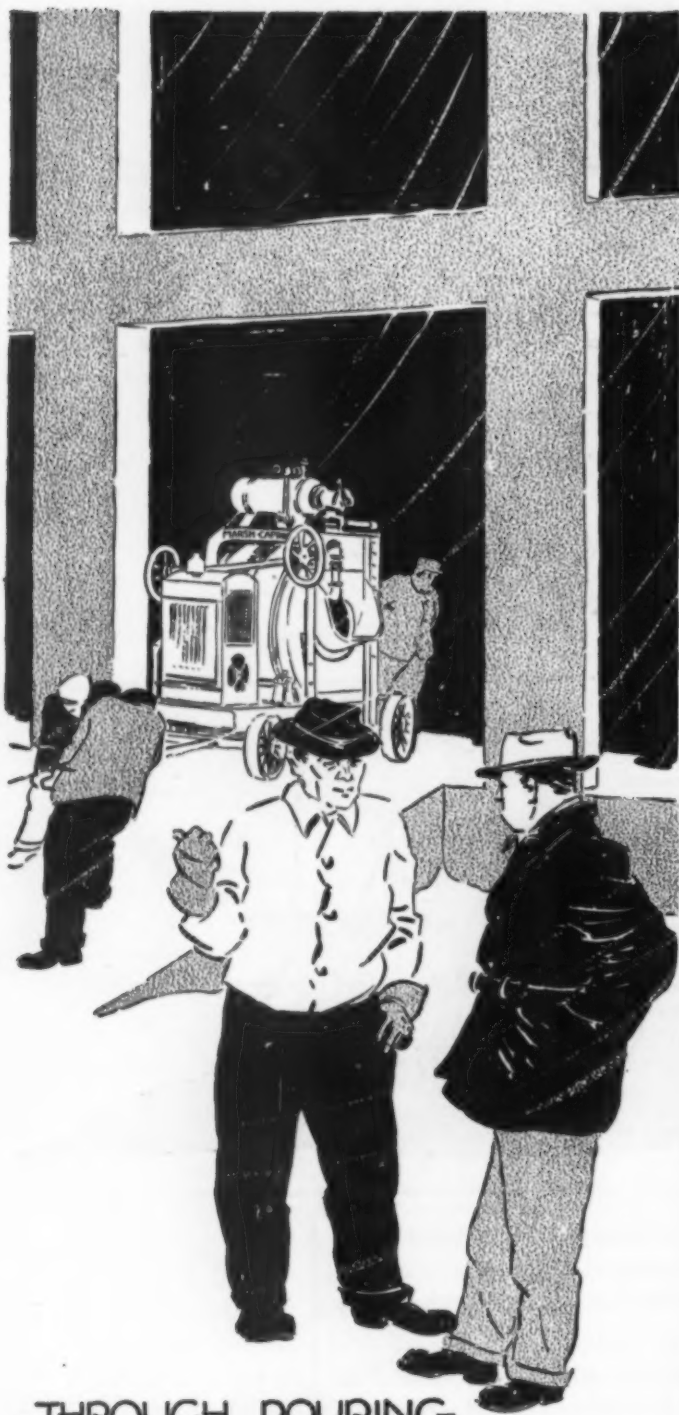
Micrometer Controlled Water

Set the Rex micrometer gauge to the exact water quantity that is called for. That quantity will be delivered on the next batch and succeeding batches. This water meets specifications of states demanding predetermined strength concrete.

REX PAVERS

(Reg. U. S. Pat. Off.)

CHAIN BELT COMPANY, 764 Park Street, Milwaukee



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ALREADY?

YES SIR! THERE ARE
NO DELAYS WITH A
FAST MIXER LIKE A
MARSH-CAPRON

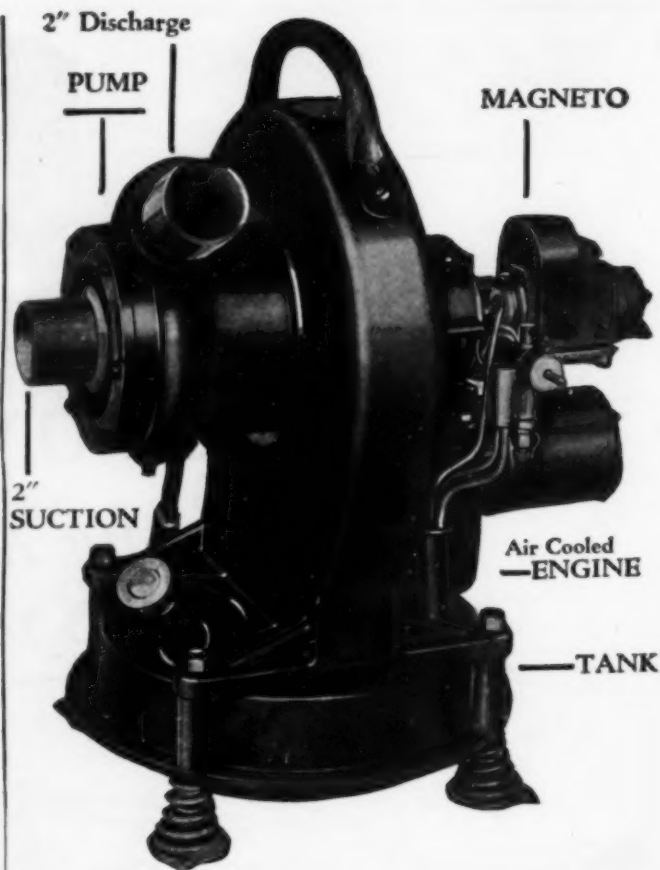


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3½S, 5S, 7S, 10S
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Tilters and non-tilters

CM1-Gray

Page One Hundred Four



7500 Gal. per hr.
Weight—95 lbs.


Think of that capacity. Then picture the size of this Homelite Portable Centrifugal Pump and Engine. One man can carry it. It will lift 22 ft. It will handle heads as high as 50 ft. and pump any liquid—even with a high percentage of solids. It delivers a 2-in. stream—7500 gal. per hr.

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This is a sturdy, well designed, generously proportioned unit. It will stand the gaff on your job. Try one and you'll want more.

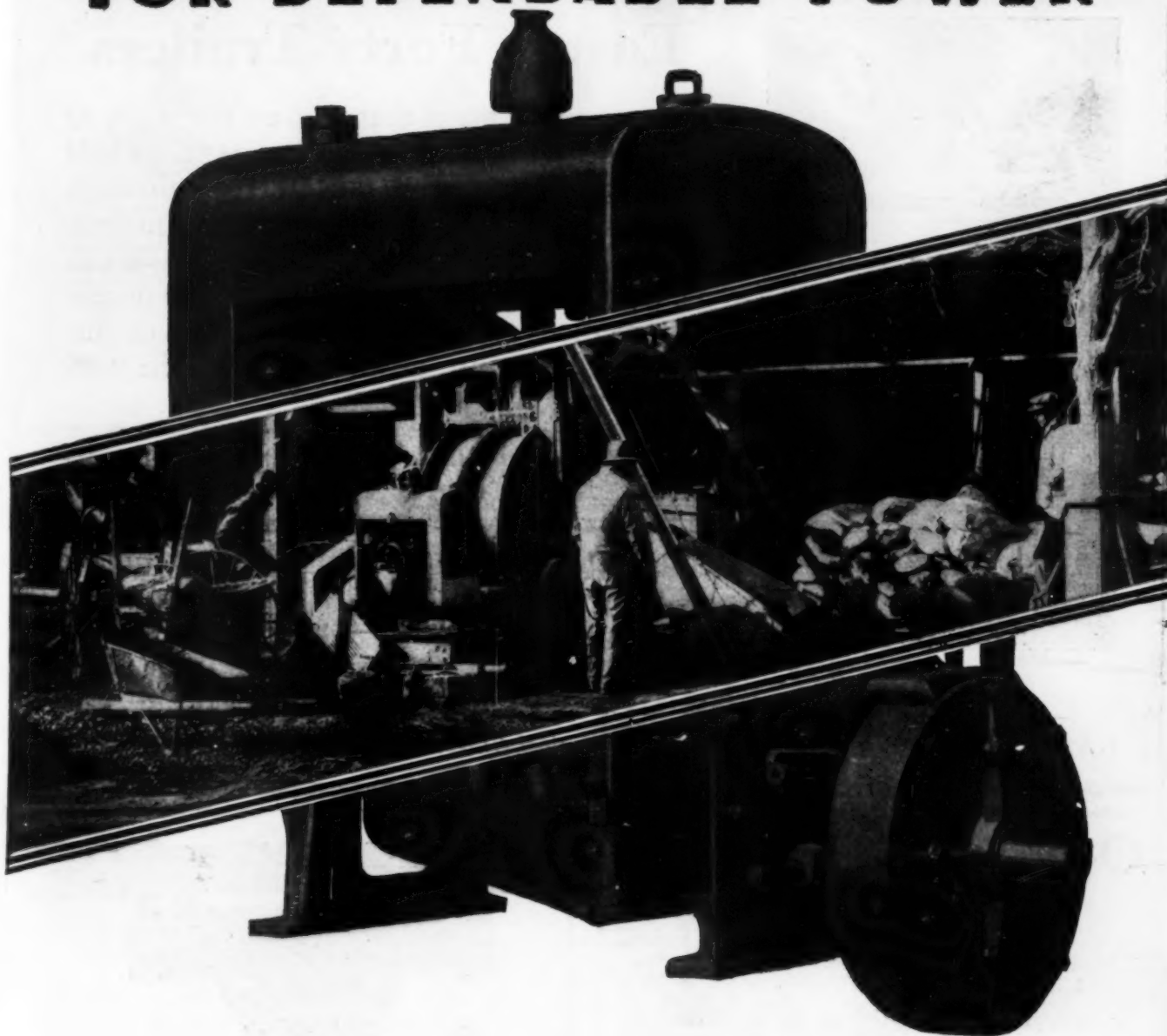
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PORT CHESTER, N. Y.

HOMELITE
PORTABLE
CENTRIFUGAL PUMP  2265

January, 1928—CONSTRUCTION METHODS

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Besides being a reliable power unit of "liberal" rating—the Le Roi Engine costs less to operate per day and per year.

Le Roi is an engine of unusual merit—of extraordinary ability. Look to it for dependable power.

Le Roi Company, Milwaukee

LE ROI ENGINES

3 to 160 HORSE POWER



Capacity
40 cu. ft. to shape.
More when heaped.



Easton Forty Trailers

A year round outfit that will do the work of three to four two-horse teams at less than half the cost. Easton Trailers work right through rain or shine. They'll help you make a fill-cut-or build a dam in record time. More loads can be hauled because their sure automatic dumping methods prevent delays at point of discharge. They are all steel, rugged in construction.

The load can be dumped when and where desired. Trailer can be backed up to or over an embankment while the tractor remains on firm ground. Tractor driver controls dumping latch from his seat, strictly a one-man operated outfit.

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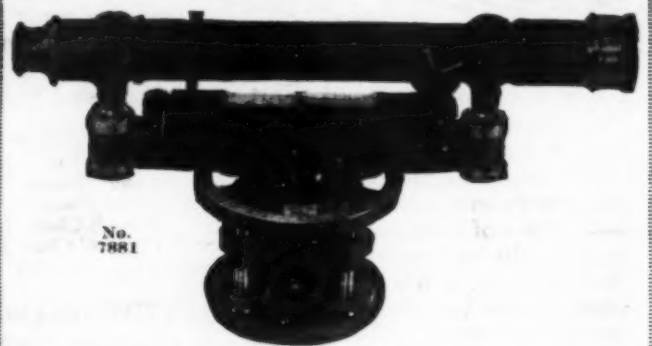
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Established 1885





Hayward Standard Orange Peel Bucket. An all around contractor's bucket, used principally for sewer work, in gravel banks, removing overburden, dredging, excavating and rehandling material generally.

A power wheel bucket of the two line type, one line being used for closing and digging, the other for holding the bucket while it is opening and discharging.



Hayward Class E Clam Shell Bucket, with Ore Bowl. A power wheel bucket of ample closing power for handling loose materials and for certain kinds of excavation.

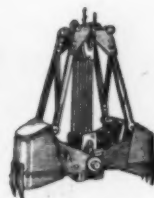
Used with Guy and Stiff Leg Derricks, Locomotive Cranes, Crawler Cranes, Floating Derricks, Railroad Excavators, and other types of hoisting mechanism.

The Ore Bowl, a tray-like shell, acts like a shovel.



Hayward Multi-Power Orange Peel Bucket. This bucket, fitted with a two part side chain has double closing power. The power wheel is of sufficient width in the score to accommodate the additional amount of closing line required.

This bucket is used in the very hardest digging jobs, such as work in clay, and compact sand.



Hayward Class K Clam Shell Bucket which permits three, five and seven part line reeving, and thus can be changed to meet practically every digging and handling requirement from light fast rehandling to hard digging.

Showing the road at the Road Show

From January 9 to 14, these Hayward Buckets will be showing engineers and contractors the road to digging and handling economy at the Road Show in Cleveland. It will pay you to note the advantages of these various types of buckets, and to talk things over with a Hayward engineer at your earliest convenience.

A Hayward engineer has just one aim in discussing buckets with you—to recommend a bucket fitted to its job in every respect. The material to be handled, the type of operating mechanism available, the limitations of the area in which the bucket will be required to work—these are but a few of the factors which must be considered before the correct type can be chosen.

The Hayward line is extensive enough, however, to provide in practically every case a standard bucket which will fully meet the need. Yet for very special requirements, buckets of special types may be supplied.

Every bucket shown on these two pages is described more fully and illustrated in action in one of the bulletins displayed below, which will be sent you on request.

Ask for them by number as follow

Orange Peel No. 655
Dwarf Orange Peel No. 657
Multi-Power Orange Peel No. 655
Class E Clam Shell No. 650
Class K Clam Shell No. 653
Drag Line No. 666a

THE HAYWARD COMPANY

44 Dey Street, New York, N. Y.



Hayward Dwarf Orange Peel—A midget digger for work in very limited spaces. Can be used inside a pipe of 12-in. and larger diameter. The depth to which it will dig is limited only by the length of the operating lines.

Digs almost any material hard or soft.



Hayward Drag Line Bucket. This drag line bucket of the heavy digging type digs as soon as the drag line is pulled tight. It fills quickly, and within its own length.



Hayward Buckets

No job can rust a Starrett Stainless Steel Tape

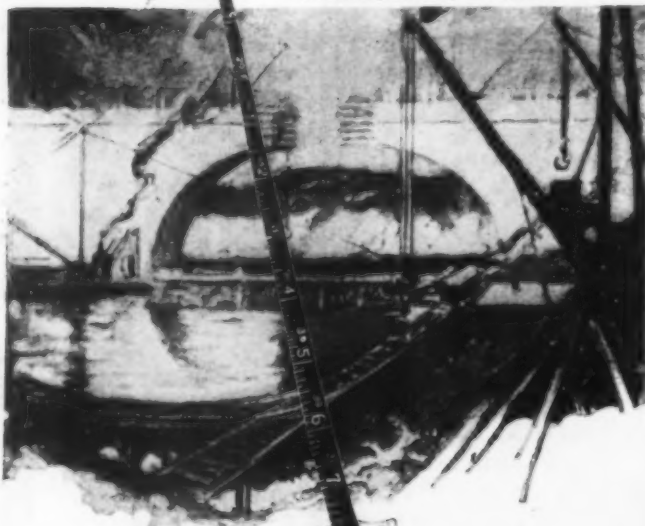


Where mud, clay or salt water plays havoc with the ordinary tape, that's the place where Starrett Stainless Steel Tapes can be of real service to you.

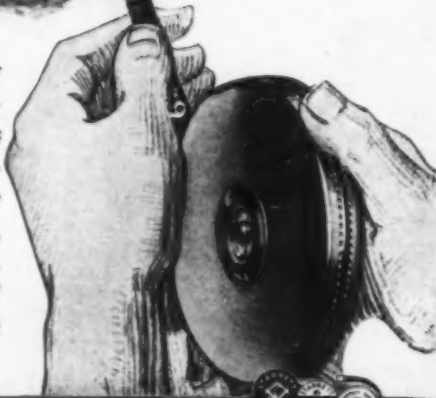
Simply run the ribbon through a wiper to remove the grit - no matter how wet - then wind it up and forget it. No rust or corrosion to scour, which means longer life and added legibility of lines and figures.

Starrett No. 521 Stainless Steel Tape is graduated in feet, tenths and hundredths; No. 520 is graduated in feet, inches and eighths of an inch. Made in 50 and 100 foot lengths with the Starrett Quick Reading Graduations, Push Button and leather case.

THE L. S. STARRETT CO.
World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
Steel Tapes—Standard for Accuracy
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See these superior tapes at your dealer's, and write us for complete description of other Starrett tapes, transits and levels. Catalog 24 "NF" will be sent free on request.



Use Starrett Tools

1325

Page One Hundred Eight

IRON MULE

The Original 2 Yard Tractor Dump



On the Job—It Proves Its Mettle

PERFORMANCE! That's what counts. That's what has earned the Iron Mule such an enviable reputation with contractors everywhere. Through mud, snow, stony ground, even swamps it takes its 2 yard load from where it was to where you want it. Dumps it. Levels it. Is back for another in no time at all. No wonder contractors who use the Iron Mule are enthusiastic. At the Road Show, Cleveland, O. Jan. 9th to 13th. Space 81 and 117. See the Iron Mule and other Hughes-Keenan equipment. See it at your Fordson dealers, or write us for complete information.

THE HUGHES-KEENAN CO., Mansfield, O

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Coal Loaders Automatic Ditch Diggers Coal Feeder

January, 1928—CONSTRUCTION METHODS

The HAISS Loader's

Precision Measuring Hopper is in a class by itself

AND what's more, it's the fastest measuring hopper on the market today. With a complete cycle in 37 seconds, including stone loading, strike-off, discharge and reset operation, the Precision Measuring Hopper there can be no question about speed.

*Come to Booth 91
at the Road Show
and we'll talk things
over.*



Note also that the hopper is telescopic and that by simply "setting-up" the nuts on the long threaded bolts, which suspend the telescopic extension, a micrometer adjustment is had for any capacity from 16 to 26 cubic feet for stone and from 8 to 16 cubic feet for sand.

If you have trucks enough a Haiss Loader will batch aggregates for two pavers.

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writes Watson G. Clark, Consulting Engineer, of 30 Church Street, New York City, of Rapid Drain Pipe.

The illustration shows where this engineer used No. 8 Rapid Drain Pipe for draining swampy ground in building new Margie St., Cresskill, Bergen Co., N. J.—Phelan & D'Arminio, Contractors.

Engineers and contractors everywhere find that Rapid Drain Pipe is superior to any other for draining roadbeds, golf courses and cellars. Shall we send you our illustrated booklet giving the reasons?



Compare The **BOSS 10S** ONE-TWO BAGGER

Faster, More Uniform Work, Greater Profits

The big 50 inch BOSS Drum fitted with the BOSS patented High Speed Remixing Action produces faster better mix, speedier discharge and results in stronger and more uniform aggregate. 10 cu. ft. of concrete mixed per batch. Discharged in from 8 to 12 seconds. Many 60 to 80 hour non-stop pourings recorded. Think what these features mean when you want to push work harder. More jobs and bigger profits.

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Ample power is assured by best multicylinder gasoline engines on the market—either LeRoi, Hercules or Novo make.

Furnished with
steel or rubber
tired wheels

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See BOSS MIXERS in Booth EH-43, Exhibition Hall

**with any mixer
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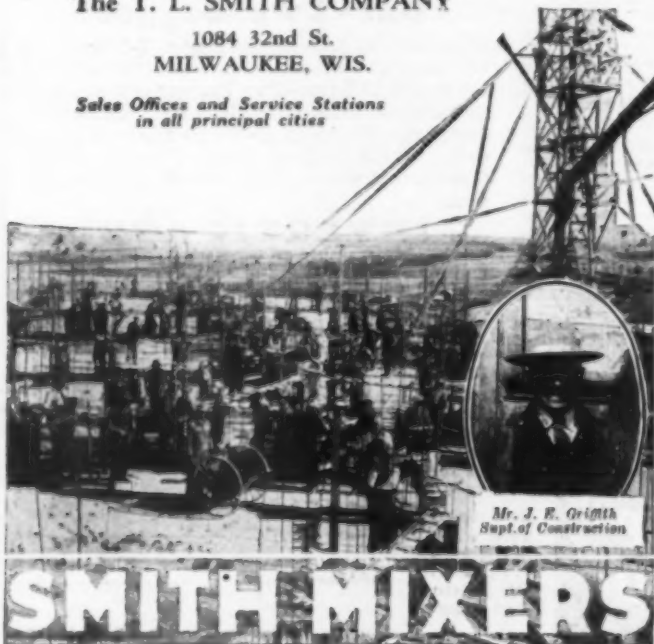
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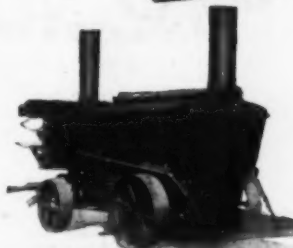
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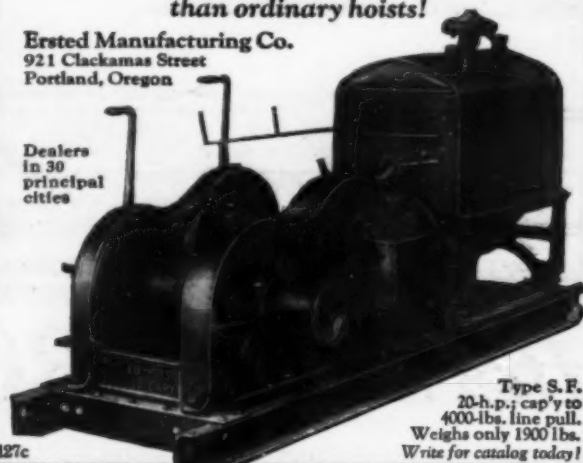
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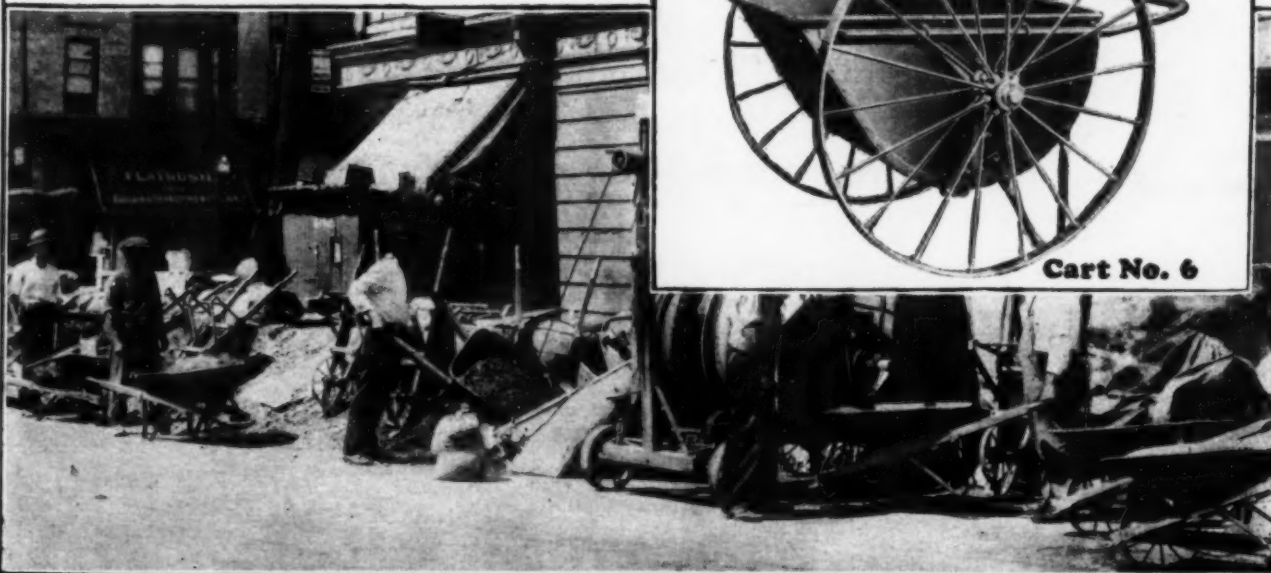
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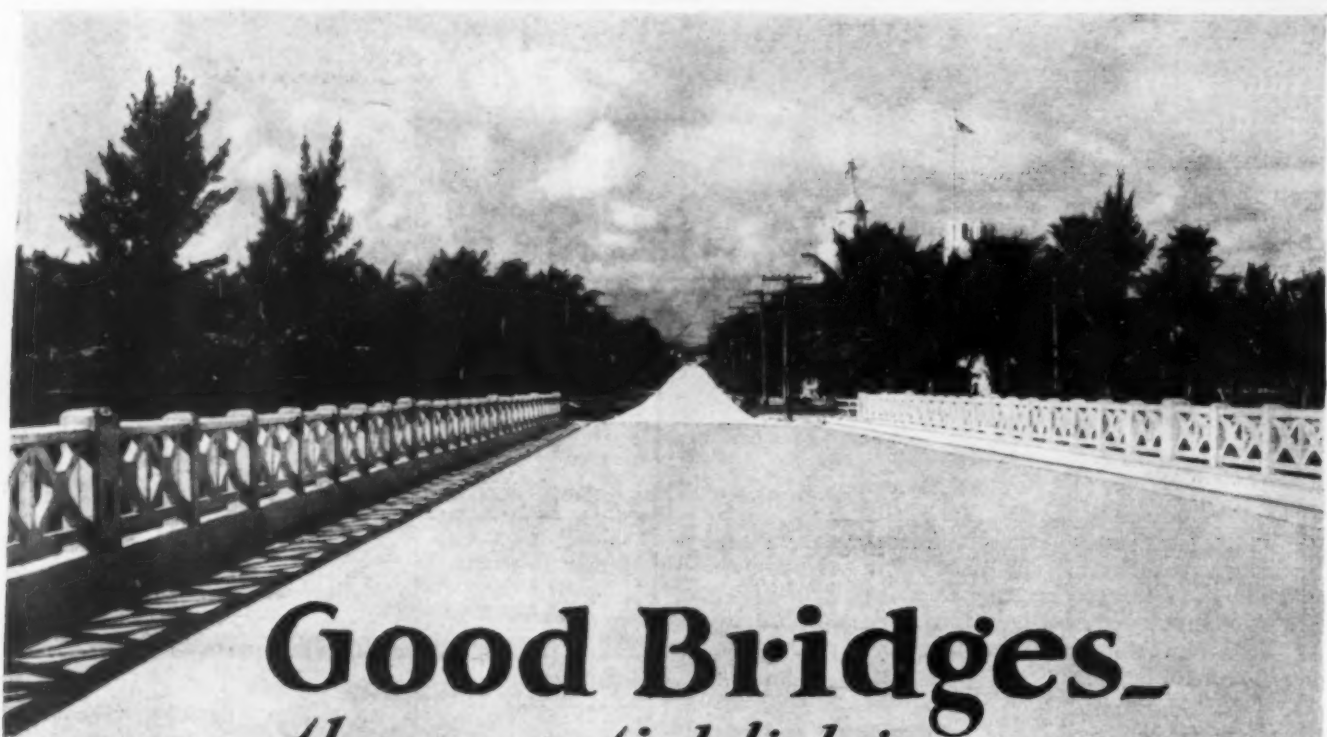
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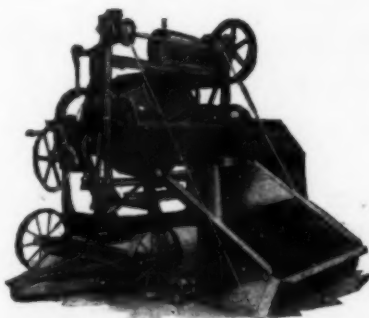
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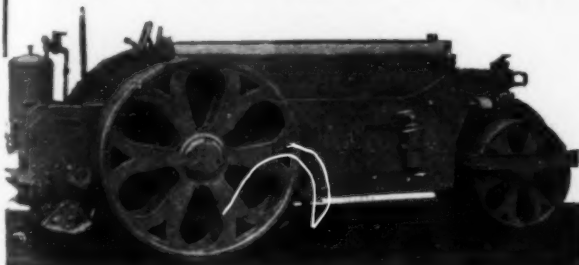
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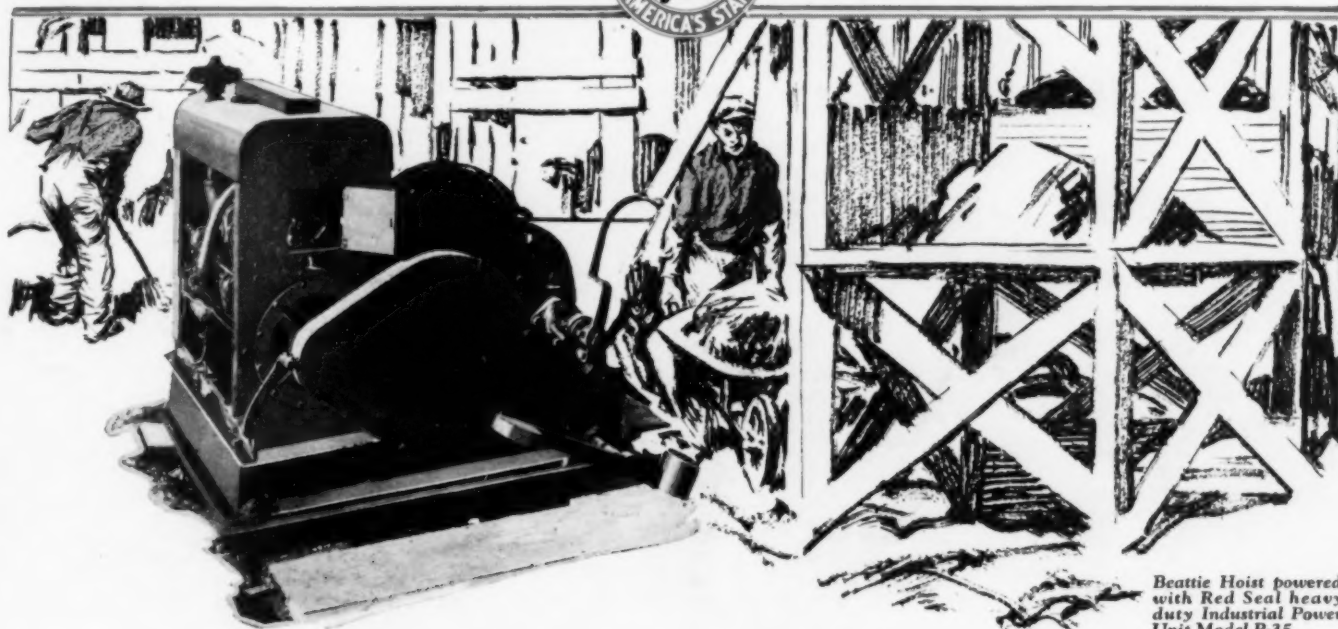
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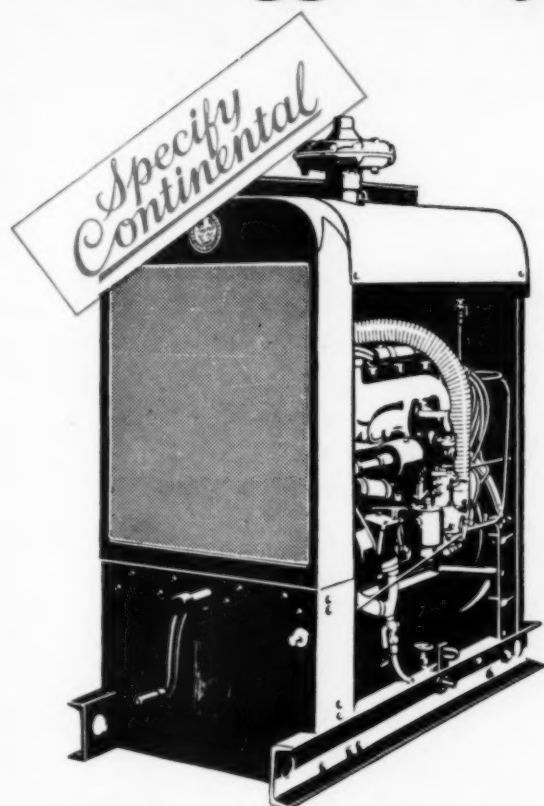
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